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Maintenance & Service Guide
Presario 1660 Model

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Specifications
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Battery Pack Operations

See the Notice for copyright and trademark information, and see the Preface for symbol conventions, Technician Notes and Serial Number locations on the unit.

Download a ZIP file of the complete MSG (1.93 MB) onto local hard drive

For content comments or questions, contact the Editor. To report a technical problem, contact your Regional Support Center or IM Help Center.

This MSG will be periodically updated online as needed.

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Notice

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Maintenance and Service Guide

Compaq Presario 1660 Model Portable Computers

First Edition (December 1999)
Compaq Computer Corporation

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Preface

This *Maintenance and Service Guide* is a troubleshooting guide that can be used for reference when servicing the Compaq Presario 1660 Model Portable Computers. Compaq Computer Corporation reserves the right to make changes to the Compaq Presario 1660 Model Portable Computers without notice.

Symbols

The following words and symbols mark special messages throughout this guide.

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of data.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Technician Notes

WARNING: Only authorized technicians trained by Compaq should repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, the user should not attempt to make repairs at the component level or to make modifications to any printed circuit board. Improper repairs can create a safety hazard. Any indications of component replacement or printed circuit board modifications may void any warranty

Serial Number

When requesting information or ordering spare parts, the computer serial number should be provided to Compaq. The serial number is located on the bottom of the computer.

Locating Additional Information

The following documentation is available to support this product:

- Compaq Presario 1660 Model Portable Computer documentation set
- *Introducing Windows 95 Guide*
- Service Training Guides
- Compaq Service Advisories and Bulletins
- *Compaq QuickFind*
- *Compaq Service Quick Reference Guide*

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Product Description

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Upper Unit Components
Front Bezel Buttons
Front Bezel Lights
Left Side Components
Right Side Components
Bottom of Unit
Rear Connectors
Power Management for Windows 98

Compaq Presario 1600 Portable Computer is a continuation of the new generation of multimedia portable computers with an innovative integrated design, outstanding audio and video, advanced core features, and attractive styling. This full-function portable computer

allows full desktop functionality.

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Troubleshooting

Preliminary Steps
Clearing the Power-On Password
Power-On Self Test (POST)
Compaq Diagnostics
Diagnostic Error Codes
Troubleshooting Without Diagnostics
Solving Minor Problems
Contacting Compaq Support

This section covers troubleshooting information for the Compaq Presario 1660 Model Portable Computer. The basic steps in troubleshooting include:

1. Follow the Preliminary Steps.

2. Run the Power-On Self-Test (POST).

3. Follow the recommended actions described in the diagnostic tables, if you are unable to run POST or if POST displays an error message.

When following the recommended actions in the Sections on POST and Diagnostic Error Codes perform them in the order listed. Rerun POST after each recommended action until the problem is solved and no error message occurs. Once the problem is solved, do not complete the remaining recommended actions.

NOTE: If the problem is intermittent, check the computer several times to verify that the problem is solved.

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Illustrated Parts Catalog

System Unit
Boards
Display Assembly
Mass Storage Devices
Miscellaneous Cable Kit
External Cables
Miscellaneous Hardware and Plastics Kits
Miscellaneous Parts
Documentation and Software

This section provides a breakdown and identifies the spare parts ordering number associated with items for the Compaq Presario 1660 Model Portable Computers.

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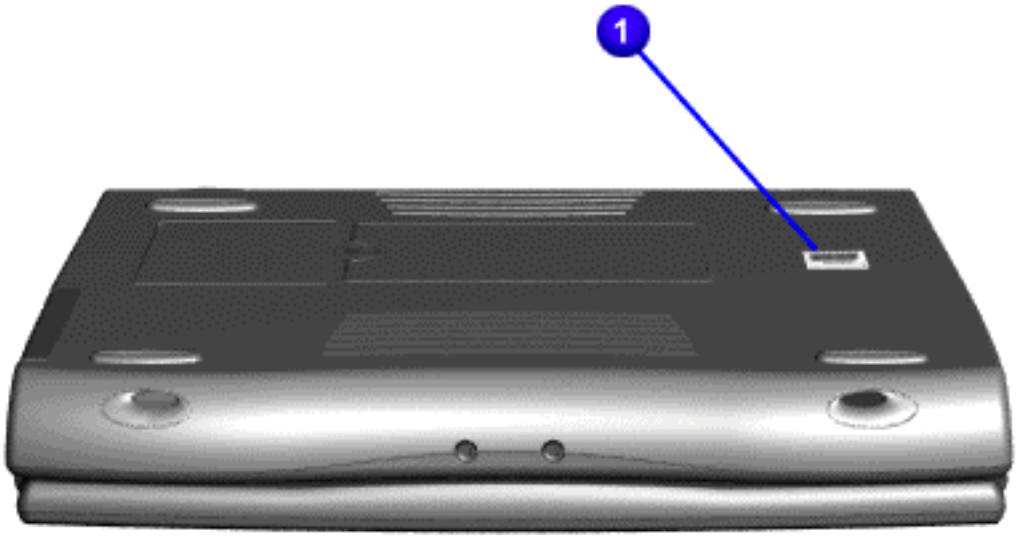
Removal and Replacement Procedures

This section explains the removal and replacement procedures for the computer.

Serial Number Location

Disassembly Sequence
Electrostatic Discharge
Service Considerations
Cables and Connectors
Preparing the Computer for Disassembly
Battery Pack
Palmrest Assembly
Keyboard and Heatspreader
Processor
Hard Drive



Report the computer serial number to Compaq when requesting information or ordering spare parts.

Upper CPU Cover
DVD Drive
Battery Charger Board
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

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Specifications

This section covers the following specifications of Compaq Presario 1660 Model Portable Computers:

Physical and environmental | System Interrupts | System DMA
System I/O Address | System Memory Catalog | Display
Diskette drive | Hard drive | CD drive
DVD drive | Battery pack

Physical and Environmental

Computer Specifications		
	U.S.	**Metric**
Dimensions		
Height Depth Width	1.97 in 12.32 in 10.12 in	4.95 cm 31.00 cm 25.40 cm
Weight	7.37 lb	3.33 kg
AC Power Requirements		

Operating Voltage Operating Current Operating Frequency Maximum Transient	100-240 V 0.8/0.4 A RMS 47-63 Hz (meets IEC 801-4 and IEC801-5) 1kV for 50 ns	
Temperature		
Operating Nonoperating	50° to 95 °F -4° to 140 °F	10° to 35 °C -20° to 60 °C
Relative Humidity (noncondensing)		
Operating Nonoperating (tw = 38.7°C max)	10 to 90% 5 to 95%	10 to 90% 5 to 95%
Altitude		
Operating Nonoperating	0 to 10,000 ft 0 to 30,000 ft	0 to 3.15 km 0 to 9.14 km
Shock		
Operating Non operating	10 G, 11 ms, half sine 240 G, 2 ms, half sine	
Vibration		
Operating Nonoperating	0.5 G 1.5 G	
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. Compaq Presario 1660 Model Portable Computers operate well within this range of temperatures.		

System Interrupts

System Interrupts	
Hardware IRQ	**System Function**
IRQ0	System Timer
IRQ1	Standard 101/102-Key or Microsoft Natural Keyboard
IRQ2	Programmable interrupt controller
IRQ3	Compaq Presario 56K-DF
IRQ4	Communications Port (COM1)
IRQ5	NeoMagic MagicWave 3DX Sound System
IRQ6	Standard Floppy Disk Controller

IRQ7	Printer Port (LPT1)
IRQ8	System CMOS/real time clock
IRQ9	Texas Instruments PCI-1211 CardBus Controller
IRQ9	NeoMagic MagicMedia 256AV
IRQ9	IRQ Holder for PCI Steering
IRQ9	IRQ Holder for PCI Steering
IRQ11	Intel 82371AB/EB PCI to USB Universal Host Controller
IRQ11	NeoMagic MagicMedia 256AV Audio
IRQ11	IRQ Holder for PCI Steering
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ14	Primary IDE controller (dual fifo)
IRQ14	Intel 82371AB/EB PCI Bus Master IDE Controller
IRQ15	Secondary IDE controller (dual fifo)
IRQ15	Intel 82371AB/EB PCI Bus Master IDE Controller

System DMA

System DMA	
Hardware DMA	**System Function**
1	NewMagic MagicWave 3DX Sound System
2	NewMagic MagicWave 3DX Sound System
3	free
4	Standard Floppy Disk Controller
5	Direct Memory Access Controller

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Connector Pin Assignments

This appendix provides connector pin assignment tables for Compaq Presario 1660 Model Portable Computers. For more information on connectors, refer to the section on Rear Connectors.

NOTE: The signals in all tables of this appendix are considered active high unless otherwise indicated by an asterisk (*).

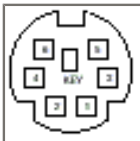
Parallel Connector

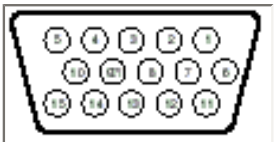
Pin	Signal	Pin	Signal
1	Strobe*	10	Acknowledge*
2	Data Bit 0	11	Busy
3	Data Bit 1	12	Paper Out
4	Data Bit 2	13	Select
5	Data Bit 3	14	Auto Linefeed*
6	Data Bit 4	15	Error*
7	Data Bit 5	16	Initialize Printer*
8	Data Bit 6	17	Select In*
9	Data Bit 7	18-25	Signal Ground
* = Active low			

Serial Connector

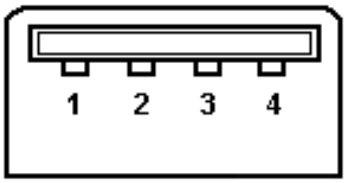
Connector	Pin	Signal

	1	Carrier Detect
	2	Receive Data
	3	Transmit Data
	4	Data Terminal Ready
	5	Signal Ground
	6	Data Set Ready
	7	Ready to Send
	8	Clear to Send
	9	Ring Indicator

Keyboard / Mouse		
Connector	**Pin**	**Signal**
	1	Data 1
	2	Clock 2
	3	Ground
	4	+5 V
	5	Clock 1
	6	Data 2

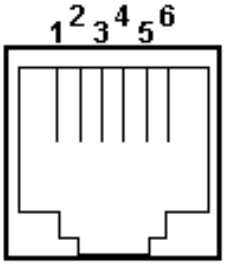
External VGA Monitor		
Connector	**Pin**	**Signal**
	1	Red Analog
	2	Green Analog
	3	Blue Analog
	4	Not connected
	5	Ground
	6	Ground Analog
	7	Ground Analog
	8	Ground Analog
	9	Not connected
	10	Ground
	11	Monitor Detect
	12	DDC2B Data
	13	Horizontal Sync
	14	Vertical Sync
	15	DDC2B Clock

Universal Serial Bus		
Connector	**Pin**	**Signal**



1	+5V
2	Data -
3	Data +
4	Ground

Modem

Connector	Pin	Signal
	1	Unused
	2	Unused
	3	Tip
	4	Ring
	5	Unused
	6	Unused

Port Replicator

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	N.C.	21	Printer Data 0	41	N.C.	61	CTS
2	N.C.	22	Printer Data 1	42	N.C.	62	DCD
3	Kb Clk 1	23	Printer Data 2	43	Switch A	63	DSR
4	Joystick Data A	24	Printer Data 3	44	Switch B	64	TXD
5	Kb Data 1	25	Printer Data 4	45	Switch C	65	RTS
6	Joystick Data B	26	Printer Data 5	46	Switch D	66	N.C.
7	Kb Clk 2	27	Printer Data 6	47	N.C.	67	Detect
8	Joystick Data C	28	Printer Data 7	48	MIDI In	68	N.C.
9	Kb Data 2	29	USB 0 -	49	MIDI Out	69	V. Sync
10	Joystick Data D	30	USB 0 +	50	+5V	70	Ground
11	Lp Select In	31	USB 1 -	51	+5V	71	H. Sync
12	Lp Paper End	32	USB 1+	52	N.C.	72	Ground
13	Lp Initialize	33	Adapter In	53	N.C.	73	Blue
14	Lp Busy	34	Adapter In	54	N.C.	74	Ground

15	Lp Error	35	Adapter In	55	N.C.	75	Green
16	Lp Ack	36	Adapter In	56	Dock ID -	76	Ground
17	Lp Auto Feed	37	Adapter In	57	RXD	77	Red
18	Lp Strobe	38	Adapter In	58	Lp Select	78	Ground
19	DDC2BC	39	N.C.	59	RI	79	N.C.
20	DDC2BD	40	N.C.	60	DTR	80	N.C

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Battery Pack Operating Time

This appendix covers the following information concerning battery pack operating time:

- Increase battery pack operating time
- Conditioning a battery pack
- Disposal of a used battery pack

Increasing Battery Pack Operating Time

Battery pack operating time differs depending on several variables. To avoid unnecessary replacement, consider the following variables when determining how long a charged battery pack should last:

- Power management settings
- Hardware configuration
- Software applications
- Installed options
- Display brightness
- Hard drive usage
- Changes in operating temperature

- Type and number of installed PC Cards

NOTE: The power consumption requirements for PC Cards vary widely. Some cards drain the battery pack very rapidly.

Battery pack operating time can be increased by as much as 50 percent by controlling the energy required by the computer and the energy stored in the battery pack.

Minimizing the Energy Required

To minimize the energy required by the computer, follow these steps:

- Set the power conservation levels in the Power Management utility to **Maximum**.
- Customize the timeout value to work more efficiently with the applications. The amount of battery life depends on the values selected.

Maximizing the Energy Stored

To maximize the energy stored in the battery pack, follow these guidelines:

- Condition the battery pack at least every 30 days to improve overall battery performance.
- Keep a battery pack in the computer when using it with AC power to supply the battery pack with a constant trickle charge.
- Store the battery pack in a cool, dry place when not in use.

Conditioning a Battery Pack

CAUTION: To avoid a loss of data, ensure that all data is saved before discharging a battery pack.

To condition a battery pack, complete the following steps:

1. Allow the battery to drain until the computer reaches hibernation and turns itself off. **Do not plug in the AC adapter during this process.** Also, the system should not be allowed to sleep. To prevent sleep, you may either use the computer while the battery is draining, or you may disable power management.

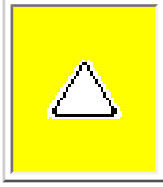
2. Plug in the AC adapter and allow the battery to charge until the LED light on the display stops blinking. Your battery gauge may read 100 percent for a period of time before LED light on the display stops blinking. Do not unplug the AC adapter until the arrow disappears.

Your battery is now re-conditioned, and you may begin using the computer normally.

The battery pack charge time may vary greatly from 2 hours to 5 hours or more, depending on many factors (including whether it is charged on-line or off-line).

Disposal of a Used Battery Pack

In the interest of safeguarding our environment. Compaq Computer Corporation recommends that nickel metal hydride (NiMH) and lithium ion (Li ion) battery packs be recycled. Battery packs should be handled in accordance with country, state, province, or local regulations.



CAUTION: Never attempt to open or service a battery pack. Opening a battery pack not only damages the pack and makes it unusable, but also expose potentially harmful battery components.

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Models and Features

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Front Bezel Buttons
Front Bezel Lights
Left Side Components
Right Side Components
Bottom of Unit
Rear Connectors
Power Management for Windows 98

Compaq Presario 1660 Model Portable Computer	
Display	13.3" TFT
Processor	300 MHz Pentium II
Hard Drive	4 GB
Memory	64 MB or 128 MB SDRAM
CD Drive	DVD
Modem	56 Kbps Data/Fax with ITU V.90
Battery	High Capacity Li Ion

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Controls and Lights

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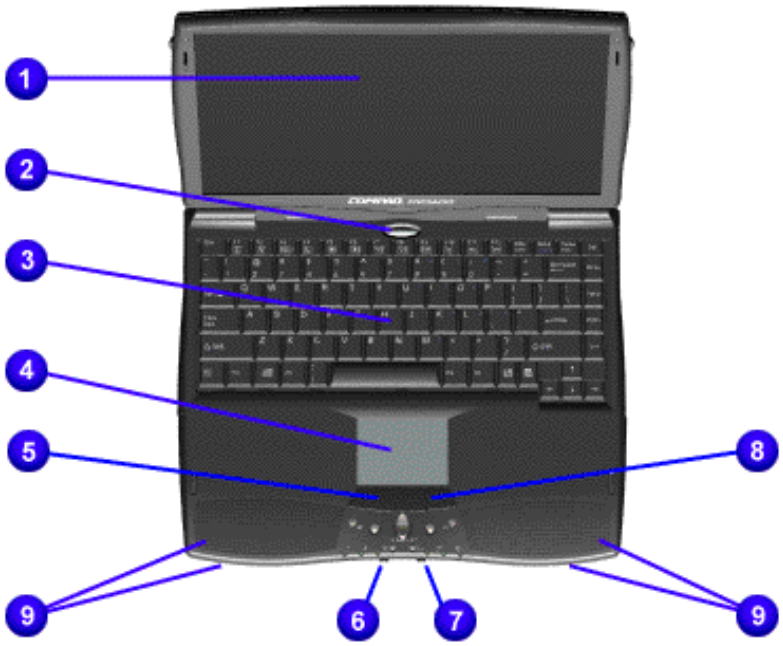

1	Display
2	Power (On/Off) Button
3	Keyboard
4	Touch Pad
5	Left Touch Pad Button
6	Headphone Jack
7	Microphone Jack
8	Right Touch Pad Button
9	Speakers and Ports

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Front Bezel Buttons

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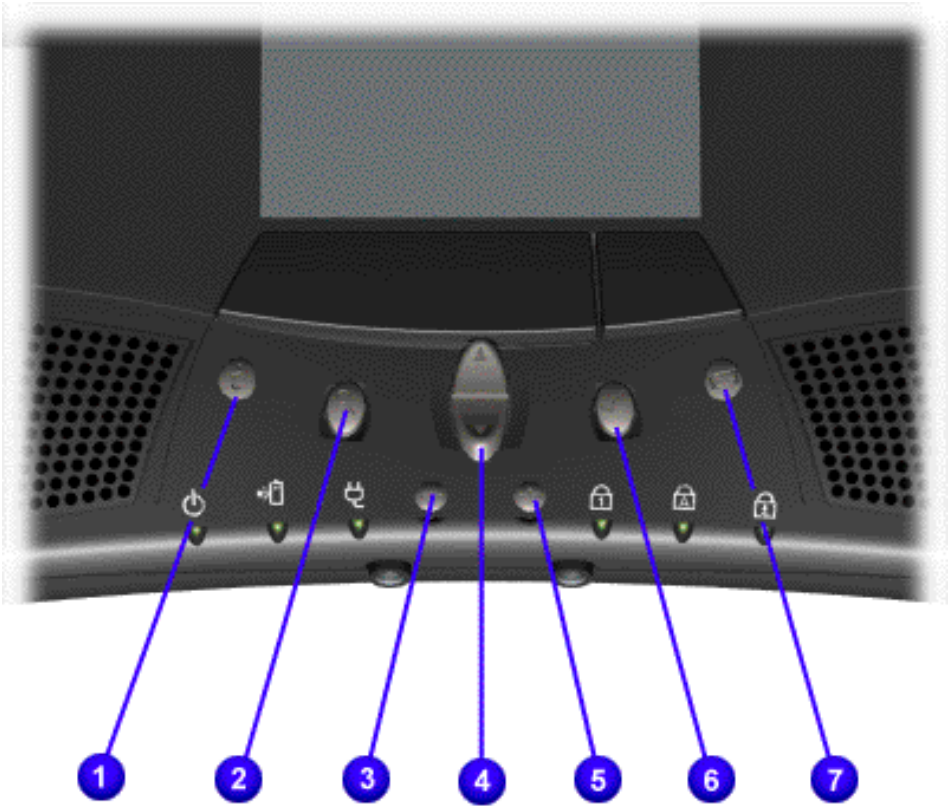

1	Instant Internet Access Button
2	Instant Search Button
3	Volume Down
4	Scroll Up/down Button
5	Volume Up
6	Secure E-Commerce Button (or Favorite Website)
7	Instant E-Mail Button

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Front Bezel Lights

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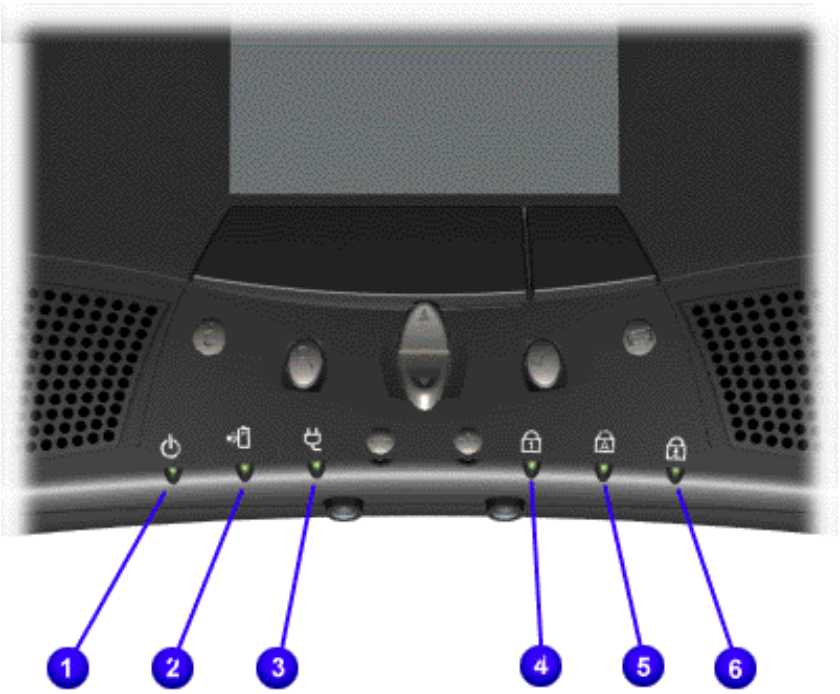

1	Power
2	Battery Charge
3	AC Adapter
4	Num Lock
5	Cap Lock
6	Scroll Lock

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Left Side Components

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Right Side Components
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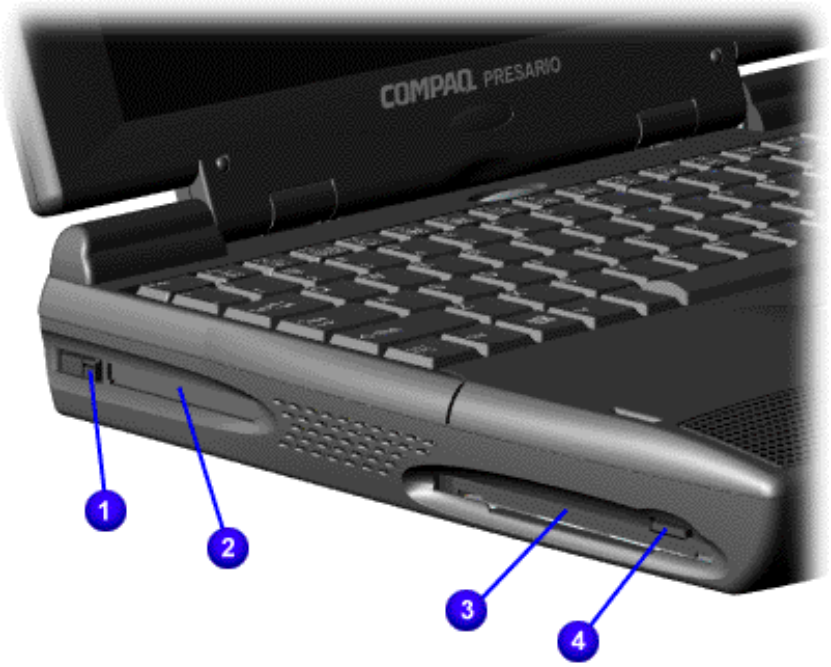

1.	PC Card Eject Lever	3.	Diskette Drive Slot
2.	PC Card Slot	4.	Diskette Eject Button

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Right Side Components

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1	Battery Compartment
2	DVD Drive
3	DVD Drive Eject Button
4	Manual DVD Eject Hole

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Bottom of Unit

Models and Features
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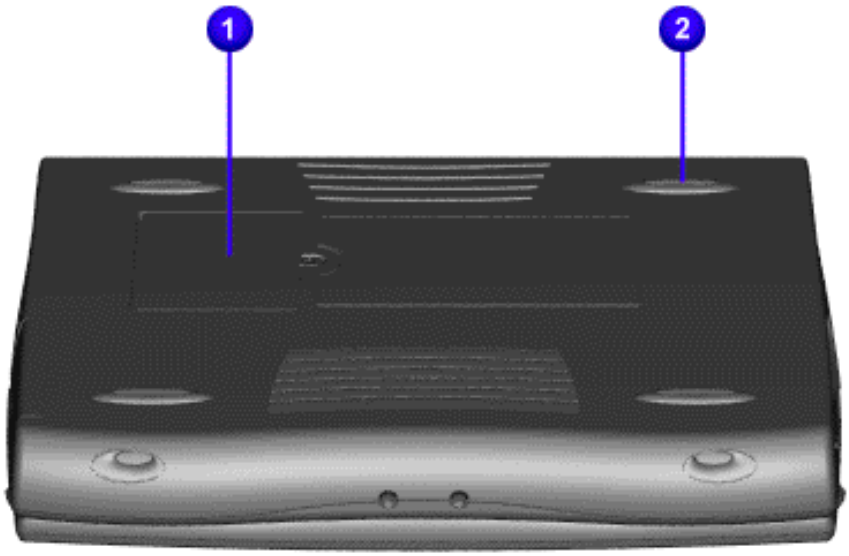

1.	Memory Compartment
2.	Feet

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Rear Connectors

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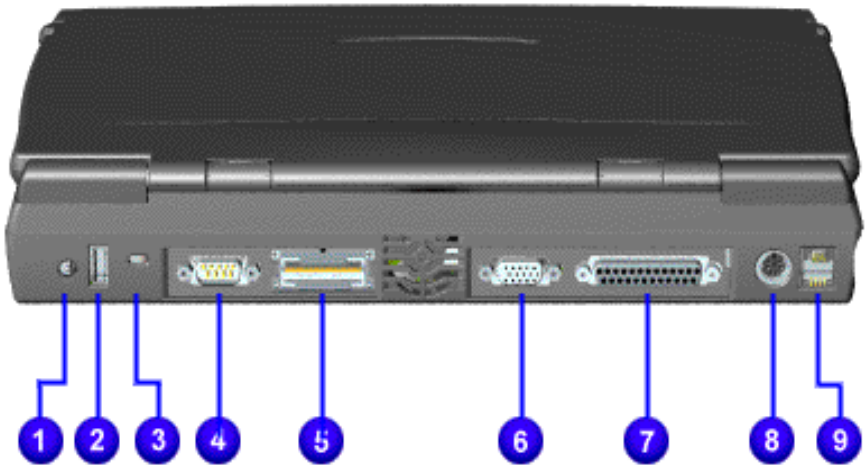

1.	AC Adapter
2.	USB
3.	Security Slot
4.	Serial Port
5.	Port Replicator Port
6.	External Monitor Port
7.	Parallel Printer Port
8.	Keyboard/Mouse Port
9.	Modem Jack

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Power Management for Windows 98

The following power management features are available for conserving AC power and extending battery operating time:

- Power Management Settings
- Sleep
- Hibernation
- Battery operating time
- Rebooting After a Lockup
- Servicing Your Computer - Full Off Mode

Power Management Settings

Depending on your patterns of computer use, you can set different levels of power management. These different power management levels can be activated based on the amount of time passed since the last system activity. System activity examples include keyboard or mouse movement, CD or DVD playback (while under program control that monitors Sleep), and modem use.

Each of the following system components can be made to go to sleep after periods of inactivity:

- system (goes into Sleep (Standby) mode)
- screen (times out and goes blank)
- hard drive (spins down)

You can select different conditions or power schemes through Power Management.The optional settings are **Home/ Office Desk**, **Portable/ Laptop**, and **Always On**. From the default settings, you can change the delay time settings. Note: the setting for hard drive must be less than or equal to the setting for System.

IMPORTANT: If you're on a network, it's recommended that you set **System Standby** to **Never**.

There are five categories of power management settings under the Control Panel. The default setting for each feature is listed below in the tables.

Power Management Properties

Tab: **Power Schemes**:	Plugged in	Running on Batteries
Always on System Standby:	Never	15 minutes
Turn OFF Monitor	After 15 minutes	After 10 minutes

Always on System Standby: After 15 minutes After 10 minutes

Power Management Properties

Tab: **ALARMS**::
Low Battery Alarm: 10%
Critical Battery Alarm 0%
Alarm Actions: X Display Message Notification

Text Action **No Action**

Power Management Properties

Tab: **POWER METER**: Default
Tab: ADVANCED Default

Display Properties

Tab: **Monitor**: Laptop Display (Maximum resolution according to unit display size)

Sleep

You can select Sleep mode instead of turning off the computer when you have finished using it. This allows the computer to wake up faster than turning it completely off and saves power over the active (On) mode. Compaq Presario Notebook computers have two levels of sleep, Hibernation and Sleep.

Hibernation - by pushing the power button once your computer will perform a save to disk followed by a shut down of the computer into Off mode.

Sleep - is a low power mode, also referred to as Standby mode. While in Sleep mode, your computer will maintain system information and open files. Unsaved information will be lost if you turn off your system prior to system wake-up, or if you lose power while using the AC adapter.

CAUTION: While in Sleep mode, your computer will maintain system information and open files. Unsaved information will be lost if you turn off your system prior to system wake-up, or if you lose power while using the AC adapter.

Hibernation Mode

Hibernation helps conserve battery life and protects your data. Hibernation can be a routine power saving event, or can be the result of a low battery condition. As it enters Hibernation your computer will display a progress screen, as it automatically saves the machine state before it shuts down and turns itself off. Your computer will automatically go into Hibernation, when the battery has little power left, or when the system (operating on battery power) has been in Sleep mode for more than an hour. You can also manually initiate Hibernation by pressing the power button once

while the system is active. To restore the computer's previous state, simply press the power button once again. While waking up, the computer will display a progress screen.

The following table shows the conditions and indicators for getting in and out of the various power management modes, Sleep, Hibernation, and Off.

Mode	To Initiate	To End	Indicators
Sleep	Manual keys combination **- Fn+F4**	Press any key	Flashing green Power LED
	Time Out Default 15 minutes. If on Battery power (system will not go to Sleep if on AC power)		
Hibernate	Manual - Press Power Button once	Press Power Button once	No Power LED, blank screen
	Time Out Default If low battery or after 1 hour of sleep (system will not Hibernate if on AC power)		
Off	Perform normal Windows shutdown via the start button, or press and hold down the power button for 4 seconds	Press Power Button once	No Power LED, blank screen

Servicing Your Computer - Full Off Mode

If you need to install or replace components in your system, you must turn the computer off *completely*. Follow the instructions above for properly putting the computer into Off mode, unplug from the outlet, and remove the battery (see battery section for instruction on removing battery).

Rebooting After a Lockup

Occasionally you may encounter a frozen keyboard or a locked screen. To reboot your computer (as if from a cold start) press and hold down the Power Button for at least four seconds, which will cause a manual shutdown. Then, restart it with a single press of the Power Button. If it still doesn't recover, press the Power Button and hold it for four seconds to shut it down, then, remove the battery or unplug the AC power for at least 30 seconds. Reinsert the battery or reconnect AC power and press the Power Button once to reboot.

Battery Operating Time

Battery operating time is affected by variables, such as the following:

- Power conservation settings
- Hardware configuration
- Software applications
- Installed options

- Display brightness
- Hard drive usage
- Power button
- Changes in operating temperature
- Type and number of installed PC Cards

For more information on increasing battery pack operating time, conditioning the battery pack, and disposing of a used battery pack, refer to the Battery Pack Operations.

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Preliminary Steps

Before running POST, complete the following preliminary steps:

1. If a power-on password has been established, type the password and press the **Enter** key. If the password is not known, clear the password.

2. Run Computer Checkup.

3. Turn off the computer and its external devices.

4. Disconnect any external devices that you do not want to test. Do not disconnect the printer if you want to test it or use it to log error messages.

IMPORTANT: If the problem only occurs when an external device is connected to the computer, the problem may be related to the external device or its cable. Verify this by running POST with and without the external device connected.

5. Install loopback plugs in the serial and parallel connectors if you would like to test these ports.

6. Ensure the hard drive is installed in the computer.

7. Ensure that the battery pack is inserted in the computer and the computer is connected to an external AC power source.

When the preliminary steps are completed, you are ready to run POST.

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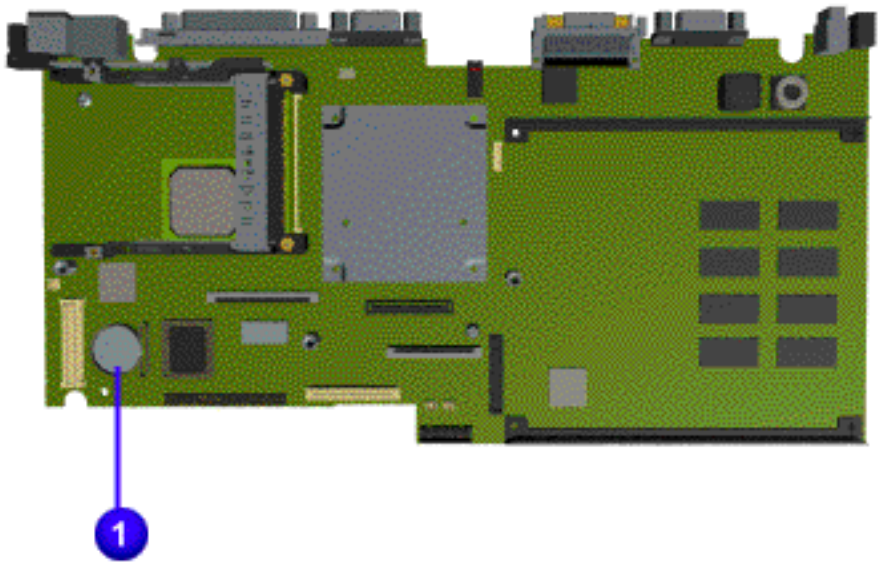
Clearing the Power-on Password



Clearing the power-on password requires removing all Setup attributes that are programmed in the CMOS.

If the password is not known, clear it by removing the RTC battery (located on the system board) as follows:

1. Turn off the computer.

2. Disconnect the power cord.

3. Remove the battery pack.

4. Remove the palmrest assembly.

5. Remove the keyboard and heatspreader.

6. Remove the modem

7. Remove RTC battery 1 for 10 seconds, then replace it .

8. Reassemble the computer.

9. Turn on the computer to verify that the power-on password has been cleared. If it has not been cleared, repeat all steps above.

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Power-On Self Test (POST)

Running POST

To run POST, turn off the computer, then turn it back on.

If POST does not detect any errors, the computer will not beep. This indicates successful completion of POST test. POST has run successfully and boots from the hard drive (or from a bootable diskette if one is installed in the diskette drive).

If POST detects errors, the errors are indicated by screen and/or audible messages. Refer to the following tables for a list of POST codes and their relevant descriptions. If there is more than one recommended action, only try the later actions in the list if the first action recommended does not solve the problem.

NOTE: If the system is not functioning well enough to run POST, or if the display is not functioning well enough to show POST error messages, refer to the Troubleshooting tables.

102	System board failure
162	System options not set
XX000YZZ 201	Memory Error

301	Keyboard Error
304	Keyboard or System Unit Error
601	Diskette Controller Error
605	Diskette Drive Error
1780	Primary Hard Drive 0 Failure
1782	Hard Drive Controller

Power-On Self-Test Messages

102-System Board Failure	
Probable Cause	**Recommended Action**
DMA, timers, etc.	Replace the system board.

162-System Options Not Set	
Probable Cause	**Recommended Action**
Configuration incorrect	Run Computer Setup.
CMOS reflects that an invalid configuration has been set.	Run Computer Setup.

XX000YZZ 201-Memory Error	
Probable cause	**Recommended action**
RAM failure	1. Replace the memory modules. 2. Replace the system board.
Memory test data error	1. Replace the memory modules. 2. Replace the system board.
XX000YZZ RAM failure	Replace the system board.

301-Keyboard Error	
Probable Cause	**Recommended Action**
Keyboard failure	1. Ensure the keys are not depressed during POST. 2. Reconnect the keyboard with the computer off. 3. Replace the keyboard.

304-Keyboard or System Unit Error	
Probable Cause	**Recommended Action**
Keyboard or system board error	1. Replace the keyboard. 2. Replace the TouchPad or mouse. 3. Replace the system board.

601-Diskette Controller Error	
Probable Cause	**Recommended Action**
Mismatch in drive type or failure in the diskette controller	1. Run Computer Checkup (TEST). 2. Check and/or replace cables. 3. Replace the system board.

605-Diskette Drive Error	
Probable Cause	**Recommended Action**

Mismatch in drive type	Run Computer Setup.

1780-Primary Hard Drive 0 Failure	
Probable Cause	**Recommended Action**
Disk 0 failed to respond	1. Run Computer Checkup (TEST). 2. Replace the hard drive.
Hard drive format error	1. Run Computer Checkup (TEST). 2. Replace the hard drive.

1782-Hard Drive Controller	
Probable Cause	**Recommended Action**
Hard drive controller failure	1. Run Computer Setup. 2. Replace the hard drive.

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Compaq Diagnostics

Compaq Diagnostics is installed on the hard drive of the computer. Run the Diagnostics utilities when you want to view or test system information and if you have installed or connected devices. If you run Compaq Diagnostics from a diskette, ensure that it is version 10.11 or later.

The Diagnostics menu includes the following utilities:

- Computer Setup
- Computer Checkup (TEST)
- View System Information (INSPECT)
- Prepare Computer for a Compaq Service Call (RemotePaq)

If you have a problem you cannot solve, run the Diagnostics utilities before you call for support. Run Computer Checkup and select to save the device list to a file and to print or to save the log of errors. Run the View System Information (INSPECT) utility and select to print or to save that information. Have the files or the printed information available when you call for support.

Computer Setup

The Computer Setup utility resides in a hidden partition on the hard drive. It gives you a snapshot of the computer's hardware andconfiguration, aids in troubleshooting, and allows you to set custom features.

Access Computer Setup when you want to:

- Modify settings for audio, storage, communications, and input devices
- Get an overall picture of the computer's hardware configuration
- Verify configuration parameters in determining problems
- Configure options
- Update time, date, or password information

To run Computer Setup:

Go to the Compaq Utilities menu and select the Computer Setup option. Follow the on-screen instructions to complete your chosen task.

Computer Checkup (TEST)

Computer Checkup (TEST) determines whether the various computer components and devices are recognized by the system and are functioning properly. You can display, print, or save the information generated by Computer Checkup.

Follow these steps to run Computer Checkup:

1. Plug the computer into an external power source. (A low battery condition could interrupt the program.)

2. Turn on the external devices that you want to test. Connect the printer if you want to print a log of error messages.

3. Insert the Compaq Diagnostics diskette in drive A.

4. Turn on or restart the computer. The computer starts from drive A, and the **Diagnostics Welcome** screen appears.

5. Press **Enter** to continue. The **Diagnostics** menu appears.

6. Select Computer Checkup from the **Diagnostics** menu. A **Test Option** menu appears.

7. Select **View the Device List** from the **Test Option** menu. A list of the installed Compaq devices appears.

8. If the list of installed devices is correct, select **OK**. The **Test Option** menu appears.

NOTE: If the list is incorrect, ensure that any new devices are installed properly.

9. Select one of the following from the **Test Option** menu:

- Quick Check Diagnostics. Runs a quick, general test on each device with a minimal number of prompts. If errors occur, they display when the testing is complete. You cannot print or save the error messages.

- Automatic Diagnostics. Runs unattended, maximum testing of each device with minimal prompts. You can choose how many times to run the tests, to stop on errors, or to print or save a log of errors.

- Prompted Diagnostics. Allows maximum control over testing the devices. You can choose attended or unattended testing, decide to stop on errors, or choose to print or save a log of errors.

10. Follow the instructions on the screen as the devices are tested. When testing is complete, the **Test Option** menu appears.

11. Exit the **Test Option** menu.

12. Exit the **Diagnostics** menu.

View System Information (INSPECT)

The View System Information (INSPECT) utility provides information about the computer and installed or connected devices. You can display, print, or save the information.

Follow these steps to run View System Information (INSPECT) from the Compaq Diagnostics diskette:

1. Turn on the external devices that you want to test. Connect the printer if you want to print the information.

2. Insert the Compaq Diagnostics diskette in drive A.

3. Turn on or restart the computer. The computer starts from drive A, and the **Diagnostics Welcome** screen appears.

4. Press **Enter** to continue. The Diagnostics menu appears.

5. Select **View System Information (INSPECT)** from the **Diagnostics** menu.

6. Select the item you want to view from the following list:

System	Memory
ROM	Audio
Keyboard	Operating system
System ports	System files
System storage	Windows files
Graphics	

7. Follow the instructions on the screen to cycle through the screens, to return to the list and choose another item, or to print the information.

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Diagnostic Error Codes

Diagnostic error codes occur if the system recognizes a problem while running the Compaq Diagnostic program. These error codes help identify possibly defective subassemblies.

The following tables list error codes, a description of the error condition, and the action required to resolve the error condition.

IMPORTANT: Retest the system after completing each step. If the problem has been resolved, do not proceed with the remaining steps.

For the removal and replacement of a particular subassembly, see **Removal and Replacement Procedures**.

Select error codes by number or type:

101 through 114	Processor Test
200 through 215	Memory Test
300 through 304	Keyboard Test
401 through 403	Parallel Printer Test
600 through 699	Diskette Drive Test
1101	Serial Test

1701 through 1736	Hard Drive Test
501 through 516	Video Test
2402 through 2456	
2458 through 2480	
3206	Audio Test
8601 through 8602	Touch Pad Pointing Device Test
3301 through 3305	CD or DVD Test
6600 through 6623	

Processor Test Error Codes		
Error Code	**Description**	**Recommended Action**
101-xx	CPU test failed	Replace the processor and retest.
102-xx	Coprocessor or Weitek Error	1. Run the Configuration and Diagnostics Utilities. 2. Replace the processor board and retest.
103-xx	DMA page registers test failed	Replace the system board and retest.
104-xx	Interrupt controller master test failed	
105-xx	Port 61 error	
106-xx	Keyboard controller self-test failed	
107-xx	CMOS RAM test failed	
108-xx	CMOS interrupt test failed	
109-xx	CMOS clock test failed	
110-xx	Programmable timer load data test failed	
113-xx	Protected mode test failed	
114-01	Speaker test failed	1. Check system configuration. 2. Verify cable connections to speaker. 3. Replace the system board and retest.
Memory Test Error Codes		
200-xx	Memory machine ID test failed	1. Flash the system ROM and retest. 2. Replace the system board and retest.

202-xx	Memory system ROM checksum failed	
203-xx	Write/Read test failed	1. Remove the memory module and retest. 2. Install a new memory module and retest.
204-xx	Address test failed	
211-xx	Random pattern test failed	
214-xx	Noise test failed	
215-xx	Random address test failed	
Keyboard Test Error Codes		
300-xx	Failed ID Test	1. Check the keyboard connection. If disconnected, turn off the computer and connect the keyboard. 2. Replace the keyboard and retest. 3. Replace the system board and retest.
301-xx	Failed Selftest/Interface Test	
302-xx	Failed Individual Key Test	
304-xx	Failed Keyboard Repeat Test	
Parallel Printer Test Error Codes		
401-xx	Printer failed or not connected	1. Connect the printer. 2. Check power to the printer. 3. Install the loop-back connector and retest. 4. Check port and IRQ configuration. 5. Replace the system board and retest.
402-xx	Failed Port Test	
403-xx	Printer pattern test failed	
Diskette Drive Test		
600-xx	Diskette ID drive types test failed	1. Replace the diskette media and retest. 2. Check and/or replace the diskette power and signal cables and retest. 3. Replace the diskette drive and retest. 4. Replace the system board and retest.
601-xx	Diskette format failed	
602-xx	Diskette read test failed	
603-xx	Diskette write, read, compare test failed	
604-xx	Diskette random read test failed	
605-xx	Diskette ID media failed	
606-xx	Diskette speed test failed	
609-xx	Diskette reset controller test failed	
610-xx	Diskette change line test failed	
697-xx	Diskette type error	
698-xx	Diskette drive speed not within limits	

699-xx	Diskette drive/media ID error	1. Replace media. 2. Run the Configuration and Diagnostics Utilities.

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Troubleshooting Without Diagnostics

This section provides information about how to identify and correct some common hardware, memory, and software problems. It also explains several types of common messages that may be displayed on the screen. The following pages contain troubleshooting information on these topics:

Audio	Power	Hard drive
Memory	Diskette/Diskette drive	Keyboard/Numeric keypad
Battery/Battery gauge	Printer	Hardware Installation
PC Card	Display	
CD or DVD drive	Touch Pad	

Since symptoms can appear to be similar, carefully match the symptoms of the computer malfunction against the problem description in the Troubleshooting tables to avoid a misdiagnosis.

WARNING: To avoid a potential shock hazard during troubleshooting procedures, disconnect all power sources before removing the keyboard cover or the display bezel.

Before Replacing Parts

Verify that cables are connected properly to the suspected defective parts.

- Run Computer Setup after connecting external devices.

- Verify that all required device drivers are installed.
- Verify that all required changes have been made to the *CONFIG.SYS* file.
- Verify that all required changes have been made to the *AUTOEXEC.BAT* file.
- Verify that all printer drivers have been installed for each application.

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Solving Minor Problems

Some minor problems and possible solutions are outlined in the following tables. If the problem appears related to a software application, check the documentation provided with the software.

Audio Battery pack Battery gauge CD/DVD drive Diskette/diskette drive Display Hard drive

Hardware installation Keyboard Memory PC card Power Printer Touchpad/pointing device

Audio Problems		
Problem	**Probable Cause**	**Solution(s)**
Computer does not beep after the Power-On Self-Test (POST).	This is typical; it indicates successful completion of the Power-On Self-Test (POST).	No action is required.

Battery Pack and Battery Gauge Problems (see also Power Problems)		
Problem	**Probable Cause**	**Solution(s)**
Computer won't turn on when battery pack is inserted and power cord is unplugged.	Battery pack is discharged.	1. Connect the computer to an external power source and charge the battery pack. 2. Replace the battery pack with a fully charged battery pack.
	Battery connectors may be bent or broken.	Check the battery connectors on the system board to verify they are evenly spaced and that they are not bent or broken.

Computer is beeping and battery LED icon is blinking.	Battery charge is low.	Immediately save any open file(s). Then either: • Connect the computer to an external power source to charge the battery pack, or • Turn off the computer or initiate Hibernation until you can find another power source or charge the battery pack.
Computer battery LED icon (front on the unit) blinks to indicate low battery condition, but computer does not beep.	Volume is turned down too low.	Adjust the volume.
Battery LED icon doesn't light and battery pack won't fast charge.	Battery pack is already charged.	No action is necessary.
	Battery pack was exposed to temperature extremes.	Allow time for the battery pack to return to room temperature.
	Battery pack is at end of its life.	Replace battery pack.
You have to set the date and time every time you turn on the computer.	RTC battery is dead.	Replace the RTC battery.
Battery pack is warm to the touch after charging.	Normal warming has occurred due to charging.	No action is required.
Battery pack operating time is far less than the documented average operating time.	Power management is turned off or disabled.	Enable power management in Computer Setup and in Windows Power Properties.
	An external device or PC Card is draining the battery.	Turn off or disconnect external devices when not using them.
	Battery pack has partially self-discharged.	Condition the battery pack by fully charging, fully discharging, then fully recharging it. To maintain the charge, leave battery packs in the computer when it is connected to external power. If the computer is disconnected from external power for more than two weeks, remove battery packs from the computer to reduce the discharge rate.
	Battery pack is being exposed to high temperatures or extremely cold temperatures.	Keep the battery pack within the recommended temperature ranges: Operating: 50° F to 104° F (10° C to 40° C) Storage: -4° F to 86° F (-20° C to 30° C) Recharge the battery pack.

CD/DVD Drive Problems

Problem	Probable Cause	Solution(s)
CD / DVD drive cannot read a compact disc.	Compact disc is upside down or is improperly inserted in the CD / DVD drive.	Open the CD / DVD loading tray, lay the compact disc in it (label side up), then close the tray.
	Trying to read a CD Plus or Pregap/ Track 0 type disc with a 24x CD-ROM drive.	None - these types of CD are unreadable with this drive.

Diskette and Diskette Drive Problems

Problem	Probable Cause	Solution(s)
Diskette drive cannot write to a diskette.	Diskette is write-protected.	Disable the diskette's write-protect feature or use a diskette that is not write-protected.
	Computer is writing to the wrong drive.	Check the drive letter in the path statement.
	Not enough space is left on the diskette.	Use another diskette.
	Drive error has occurred.	Run Computer Checkup from the Compaq Diagnostics diskette.
	Diskette is not formatted.	Format the diskette. At the system prompt, enter FORMAT A:
Diskette drive cannot read a diskette.	The wrong type of diskette is being used.	Use the type of diskette required by the drive.
	Diskette has a bad sector.	Copy files to hard drive or another diskette. Reformat bad floppy.
	Drive error has occurred.	Run Computer Checkup from the Compaq Diagnostics diskette.
	Diskette is not formatted.	Format the diskette. At the system prompt, enter FORMAT A:
Cannot boot from diskette.	Bootable diskette is not in drive A.	Put the bootable diskette in drive A.
	Diskette Boot has incorrect setting in Computer Setup.	Run Computer Setup and set diskette as first to boot.

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Contacting Compaq Support

Obtain the following information before contacting Compaq Reseller Support:

- Product name
- Product serial number
- Purchase date
- Conditions under which the problem occurred
- Any error messages that have occurred
- Hardware configuration
- Type of printer connected
- Hardware/software being used
- Printed result of Computer Checkup (TEST)
- Printed copies of *CONFIG.SYS* and *AUTOEXEC.BAT* files, if possible

Shipping Preparation

To ship the computer, complete the following steps:

1. Back up the critical hard drive files. Ensure that backup tapes/diskette are not exposed to electrical or magnetic fields while stored in transit.

2. Turn off the computer and external devices.

3. Disconnect the external devices from their power sources, then from the computer.

IMPORTANT: Ensure that there is no diskette in the diskette drive and that there are no PC Cards in the PC slots.

4. Close the display and all exterior doors of the computer.

5. Pack the computer with sufficient packing material to protect it. Use the original packing box or similar packaging.

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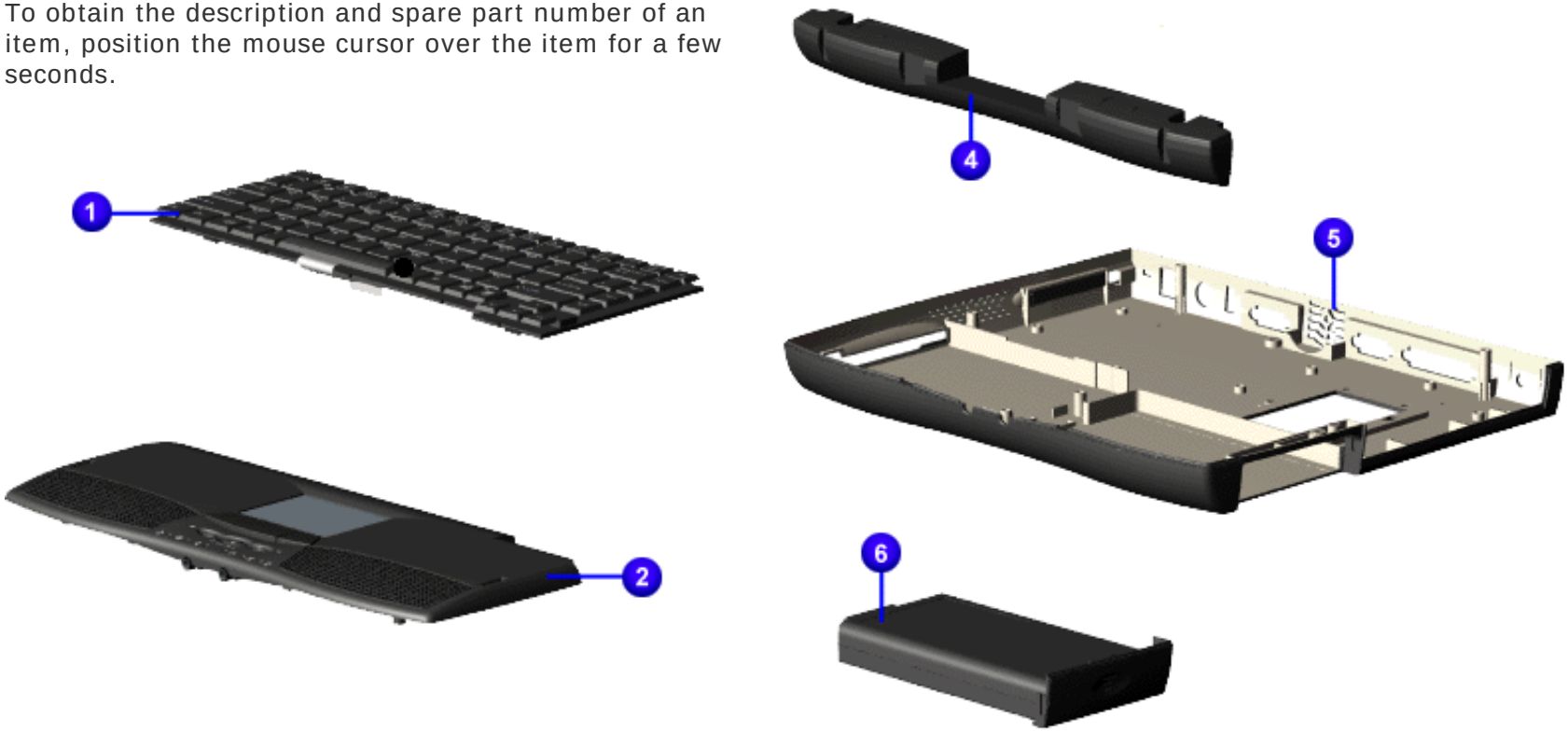
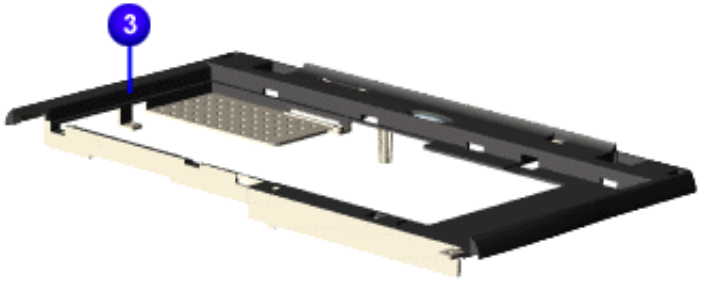
Mass Storage Devices
Miscellaneous Cable Kit
External Cables
Miscellaneous Hardware and Plastics Kits
Miscellaneous Parts
Documentation and Software

To obtain the description and spare part number of an item, position the mouse cursor over the item for a few seconds.





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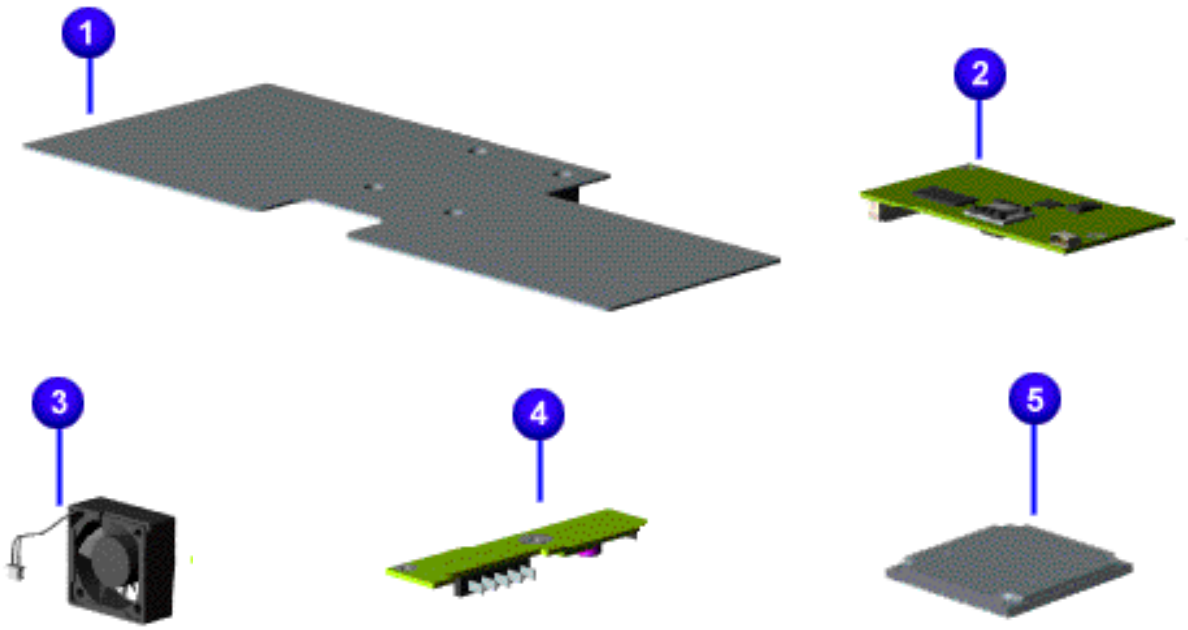
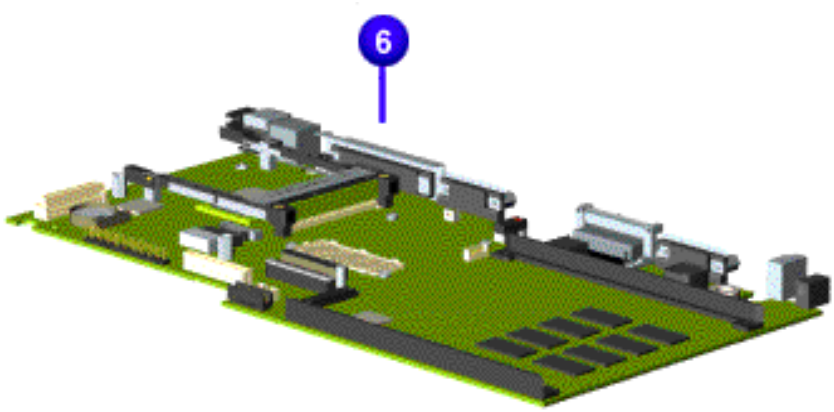
Not shown: 128-MB SODIMM Memory 388646-001





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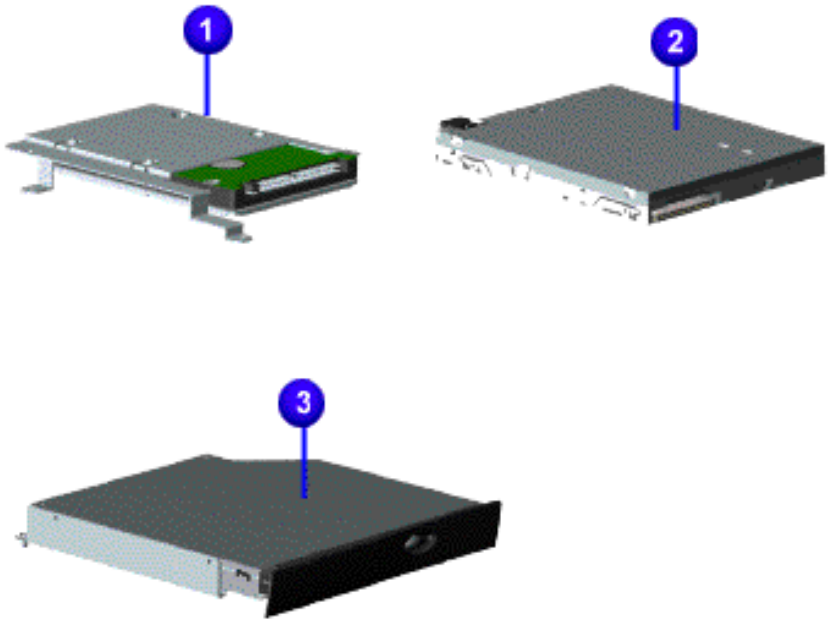
To obtain the description and spare part number of an item, position the mouse cursor over the item for a few seconds.



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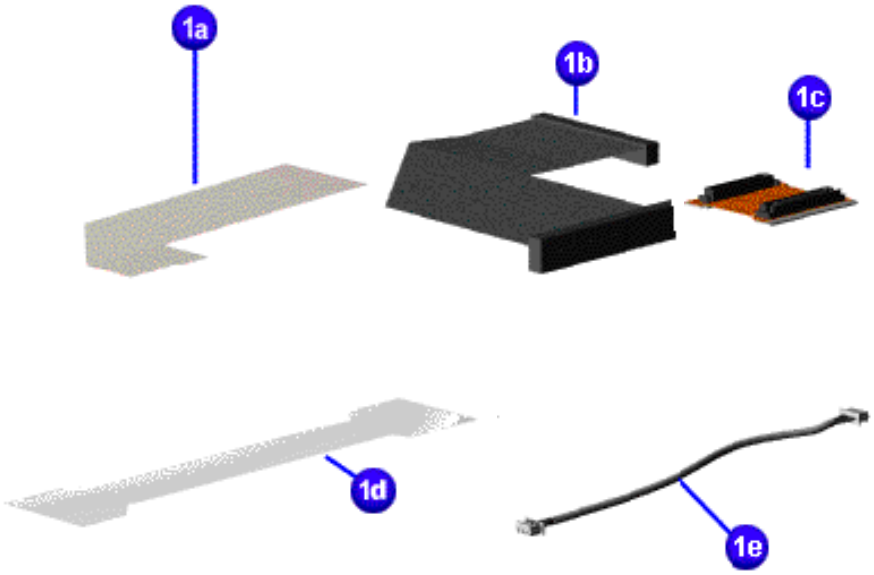
Cable Kit Spare Part Number: 330946-001
Contains each of the cables shown.



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Description	Spare Part Number
AC Power Cord	
Australia	293831-011
China (PRC)	293831-AA1
Modem cable	
Australia	304398-011
China (PRC)	304398-AA1

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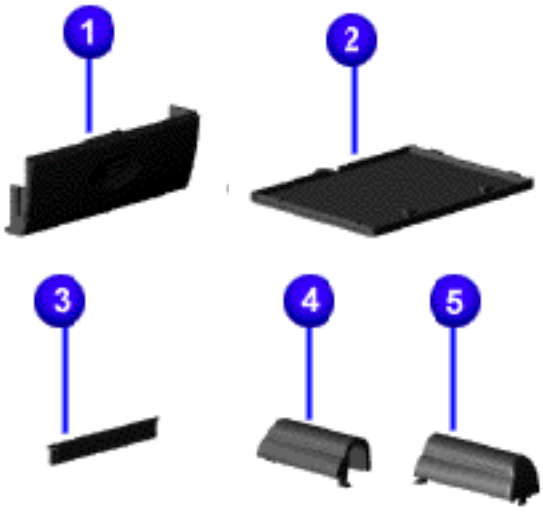
To obtain the description of an item shown, position the mouse cursor over the item for a few seconds.

Miscellaneous Plastics Kit
Spare Part Number: 330949-001

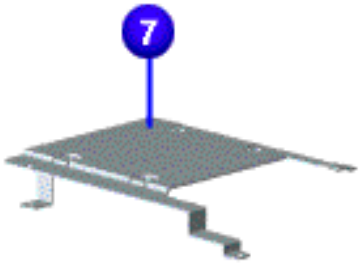
Contents:



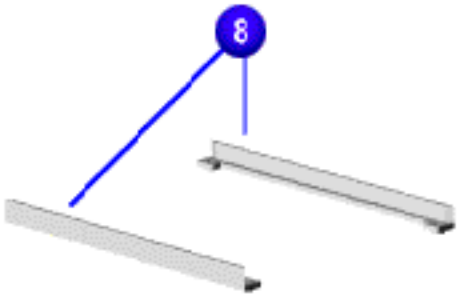
Miscellaneous Screw Kit
Spare Part Number 330959-001

Miscellaneous Hardware Kit Spare Part Number: 346853-001

Contents:



(not shown)
4 PCMCIA Torsion Springs
LCD Cable Guide



(not shown) 4 Rubber Plugs Left and Right Latches 8 Rubber Feet

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Other parts not shown:

Logo Kit	352887-001
Return Kit	293799-001

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Description	Spare Part Number
Quick Restore CD Australia China (PRC)	 388205-371 388205-AA1
Quick Reference Guide (single issue) Quick Reference Guide (quarterly subscription)	162212-001 184960-001
QuickFind for Windows*, Asia Pacific Edition	137906-xxx

*QuickFind is updated monthly. To complete the QuickFind part number, add the suffix from the table below for the desired month. If you do not specify the 3-digit suffix, the default is the current month in which the order is placed.

QuickFind Part Number Suffix			
Suffix	**Month**	**Suffix**	**Month**
-001	January	-007	July
-002	February	-008	August

-003	March	-009	September
-004	April	-010	October
-005	May	-011	November
-006	June	-012	December

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Electrostatic Discharge

A sudden discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) may not be affected at all and will work perfectly throughout a normal cycle. Although, it may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

Generating Static

The table shows how different activities generate static electricity and at different electrostatic voltage levels.

Typical Electrostatic Voltages			
	Relative Humidity		
Event	**10%**	**40%**	**55%**
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tubes	2,000 V	700 V	400 V

Removing DIPS from vinyl trays	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	14,500 V	5,000 V	3,500 V
Removing bubble pack from PCBs	26,000 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V
NOTE: 700 volts can degrade a product.			

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Service Considerations

Listed below are some of the considerations that you should keep in mind during the disassembly and reassembly of the computer.

Tool and Software Requirements

To service the computer, you need the following:

- Compaq screwdriver kit (Spare Part No. 161946-001)
- Torx T-9 screwdriver
- 3/16-inch and 5mm nut drivers (for screwlocks and standoffs)
- Small, standard screwdriver
- Small, Phillips screwdriver
- Diagnostics software

Screws

The screws used in the computer are not interchangeable. If an incorrect screw is used during the reassembly process, it can damage the unit. Compaq strongly recommends that all screws removed during disassembly be kept with the part that was removed, then returned to their proper locations.

IMPORTANT: As each subassembly is removed from the computer, it should be placed away from the work area to prevent damage.

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Cables and Connectors

Most cables used throughout the unit are ribbon cables. Cables must be handled with extreme care to avoid damage. Apply only the tension required to seat or unseat the cables during insertion or removal from the connector. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing the cables, and ensure that the cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced.

Cables

Use the following precautions when handling cables to avoid damage to the cable or computer:

- Always handle cables by their connectors.
- Avoid bending, twisting, or pulling on the cables.
- Apply minimum required force when seating or unseating the cables from their connectors.
- Place the cables in such a manner that they cannot be caught or snagged by parts being removed or replaced.
- Handle flex cables with extreme care; they can tear easily.

CAUTION: When servicing these computers, ensure that cables are placed in their proper location during the reassembly process. Improper cable placement can cause severe damage to the unit.

Select the desired illustration.

Removing a cable from a **ZIF Connector**.

The ribbon cable position for the **hard drive**.

The ribbon cable position for the **DVD drive.**

The ribbon cable position for the **diskette drive**.

The cable position for the **speaker assembly.**

Plastic Parts

Plastic parts can be damaged by the use of excessive force during disassembly and reassembly. When handling the plastic parts, use care. Apply pressure only at the points designated in the maintenance instructions.

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Battery Pack
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Upper CPU Cover
DVD Drive
Battery Charger Board
Modem

Before removing or replacing any components, the following procedures ***must*** be completed:

1. Disconnect AC power and any external devices.

2. Remove the battery pack.

3. Remove any PC Cards.

WARNING: Metal objects can damage the battery pack as well as the battery contacts in the battery compartment. To prevent damage, do not allow metal objects to touch the battery contacts. Place only the battery pack for the Compaq Presario 1660 Model Portable Computers into the battery compartment. Do not force the battery pack into the bay if insertion does not occur easily.

CAUTION: Do not crush, puncture, or incinerate the battery pack. Do not open a battery pack, as this damages the pack, makes it unusable, and exposes potentially harmful battery components. There are no field-serviceable parts located inside the battery pack.

Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

NOTE: The Compaq Presario 1660 Model Portable Computers have several screws of various sizes which are **not** interchangeable. Care must be taken during reassembly to ensure that the correct screws are used in their correct location. During removal please keep respective screws with their associated sub-assembly.

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Processor
Hard Drives
Upper CPU Cover
DVD Drive
Battery Charger Board
Modem
Display Panel Assembly

To remove the battery pack, complete the following steps:

1. Slide the battery pack compartment door down and remove it from the battery pack.

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Diskette Drive
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System Board
Memory Module

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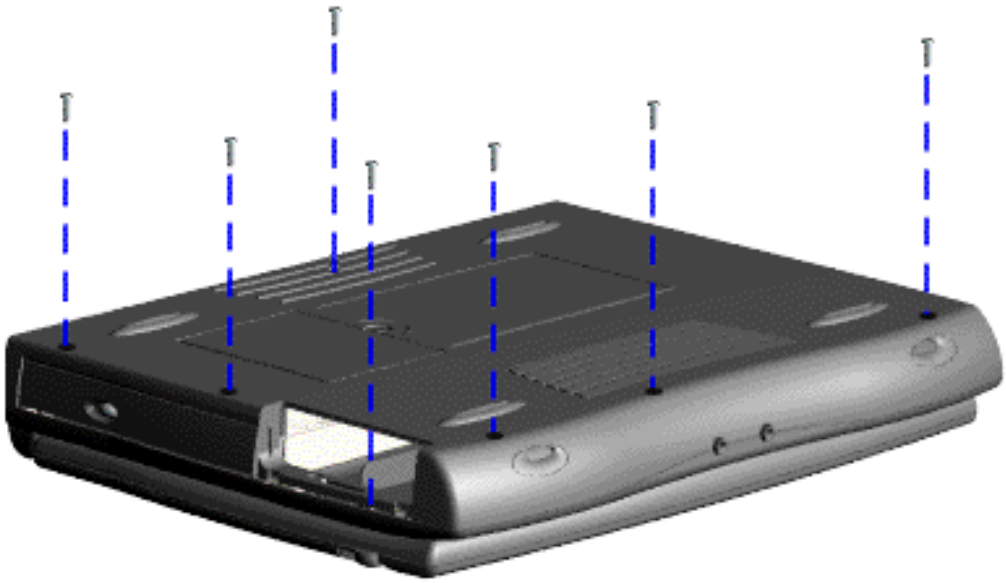

The Palmrest Assembly must be removed to gain access to any of the interior components of the computer, and it is the first component that has to be removed to gain access to the interior components.

To remove the Palmrest Assembly, complete the following steps:

Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

1. Prepare the computer for disassembly.

2. Close the computer and turn it upside down.

3. Remove seven screws from the bottom of the computer.

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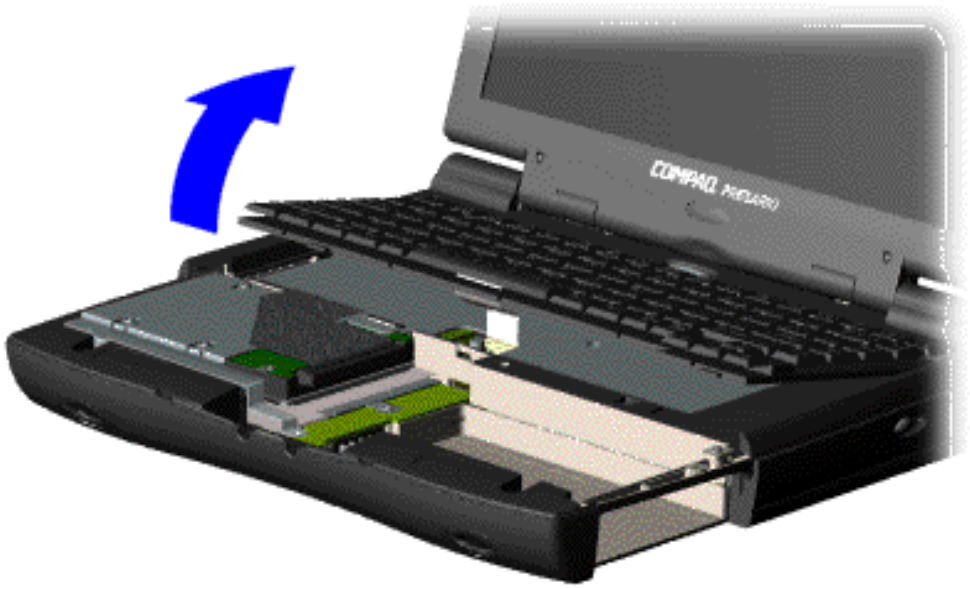

The keyboard and heatspreader are best removed together.

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Lift up the front of the keyboard and place the keyboard upside-down in the palmrest cavity.

Display Panel Assembly

Speaker Assembly

Diskette Drive

Fan Assembly

System Board

Memory Module

Next Step

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Removing the Processor

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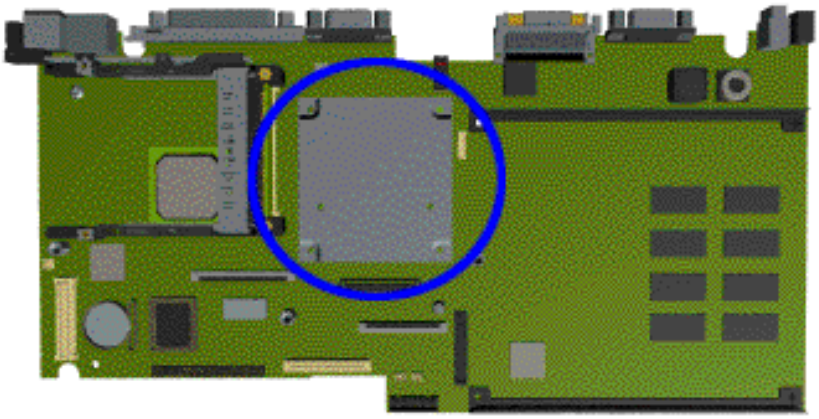

To remove the processor, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Remove the keyboard and heatspreader.

4. Rock the processor back and forth just a little until it comes out of the processor chassis slot.

To reinsert the processor:

Keyboard and Heatspreader
Processor
Hard Drives
Upper CPU Cover
DVD Drive
Battery Charger Board
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

Align the screw holes (on the processor) nearest the speakers with the corresponding screw sockets on the system board, then push the processor in carefully but firmly.

CAUTION: If the processor is not correctly aligned with the socket, the connectors on either the processor or the system board will be bent out of alignment. The processor or board will then be destroyed, and will need to be replaced.

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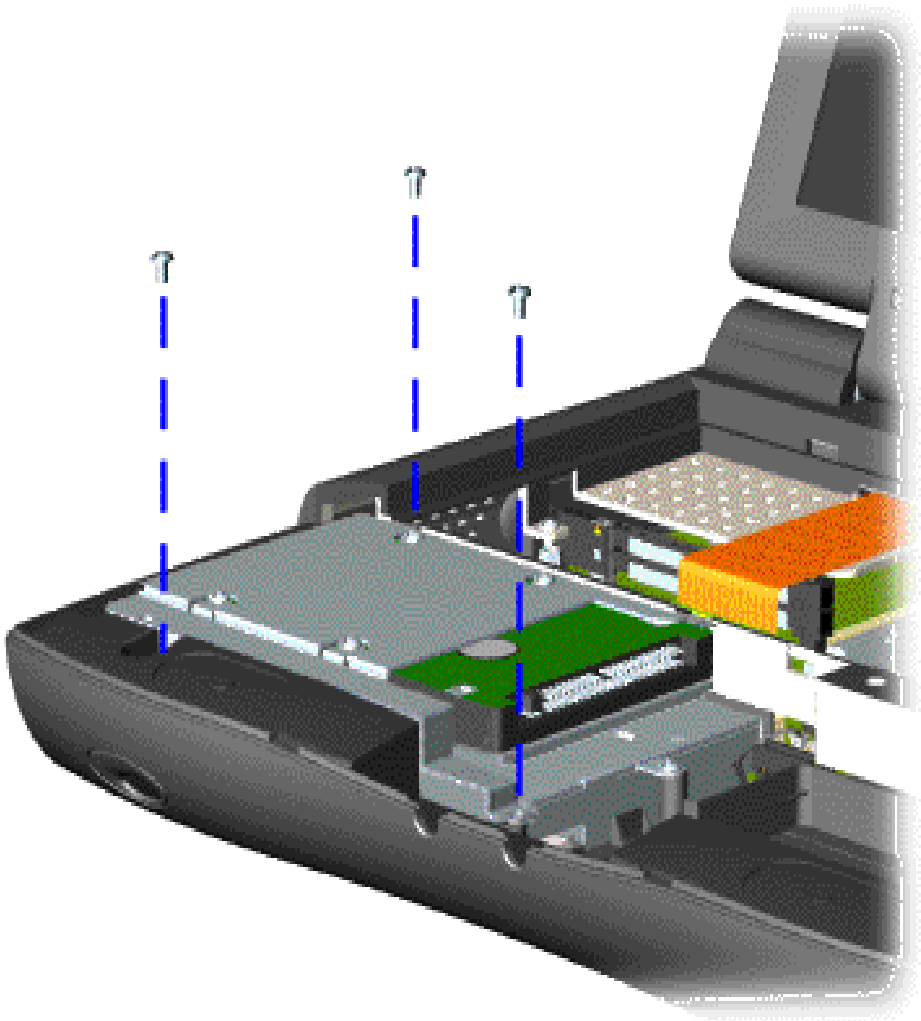

To remove the hard drive, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the Palmrest Assembly.

3. Remove the keyboard and heatspreader.

4. Remove two screws from the hard drive mounting bracket and lift up the hard drive.

Battery Charger Board
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

Next Step

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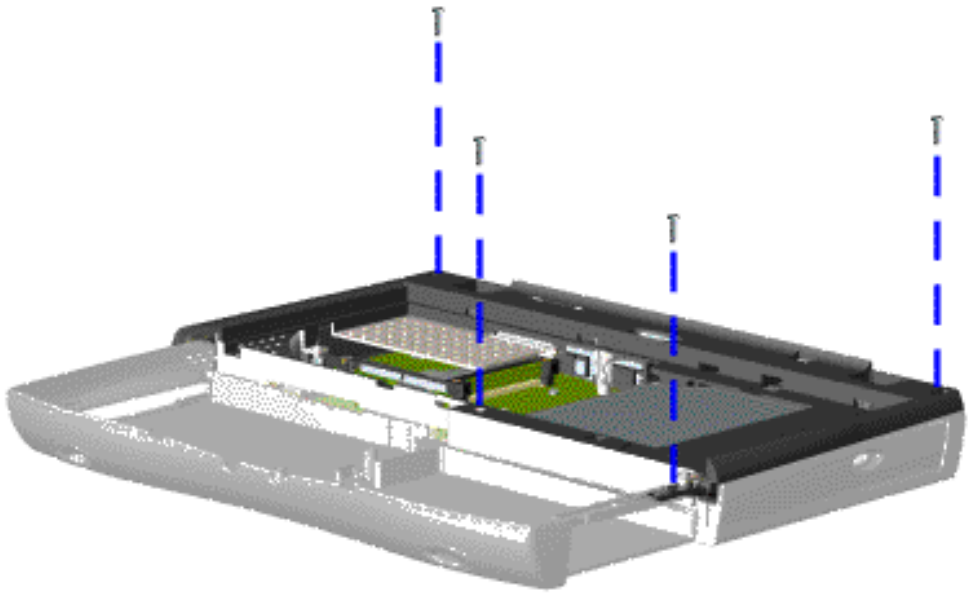

To remove the Upper CPU cover complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Remove the keyboard and heatspreader.

4. Remove the hard drive.

5. Remove the display panel

DVD Drive
Battery Charger Board
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

assembly.

6. Remove four screws holding the cover to the chassis.

7. Lift the Upper CPU Cover off the chassis.

To replace the Upper CPU Cover, reverse the previous steps.

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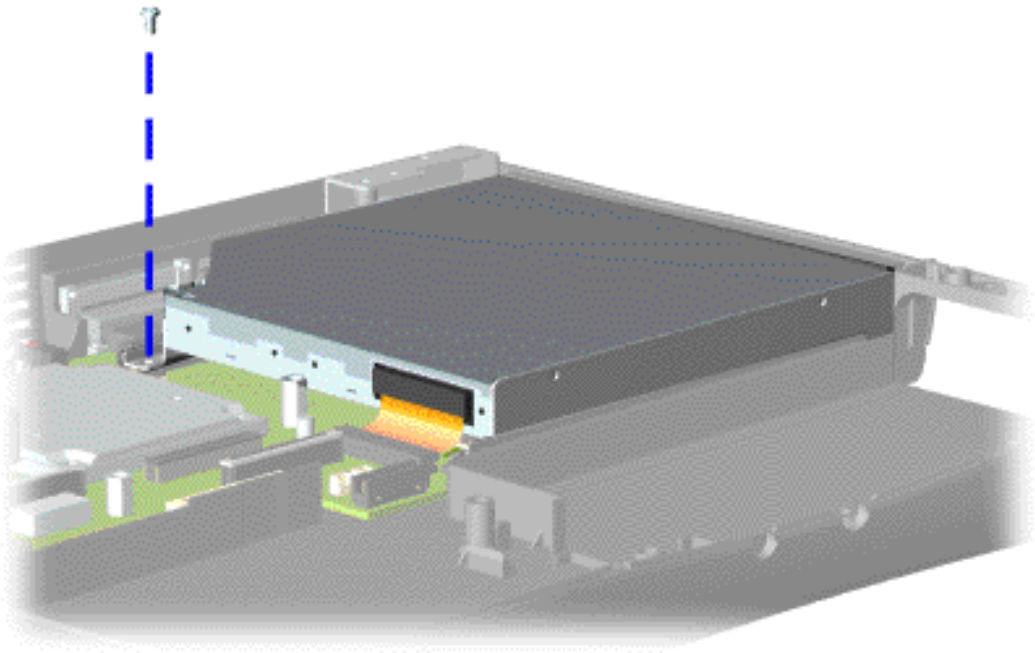

To remove the DVD drive, complete the following steps:

1. Prepare the computer for disassembly. If a CD or DVD disc is jammed in the drive, remove it manually.

2. Remove the Palmrest Assembly.

3. Remove the keyboard and heatspreader.

Battery Charger Board
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
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4. Remove the upper CPU cover.

5. Remove the screw at the back end of the DVD drive near the edge of the system board.

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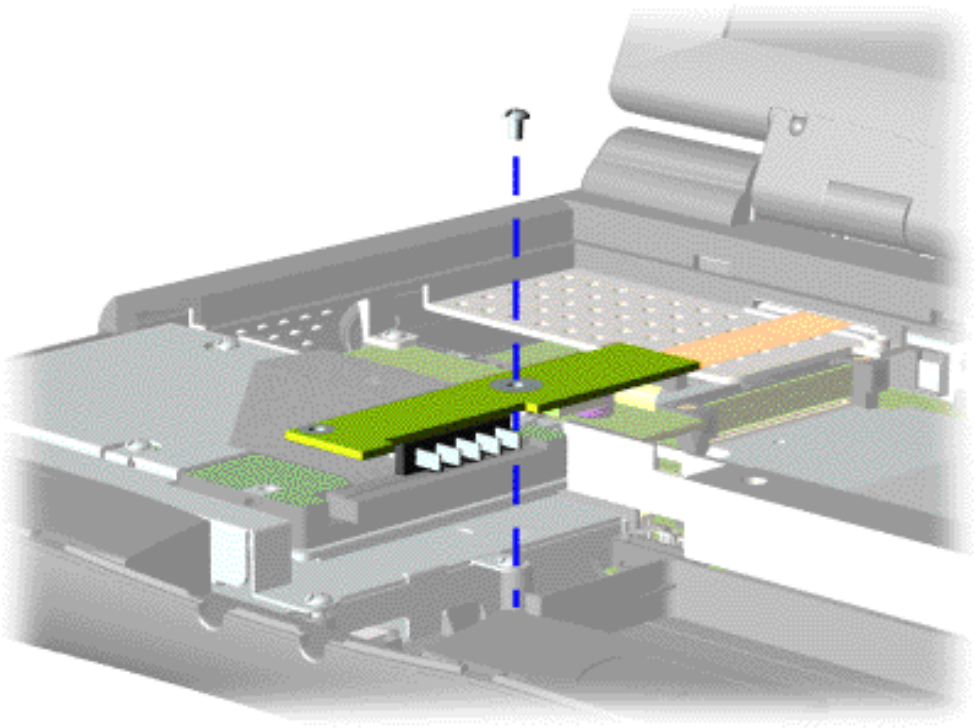

To remove the battery charger board, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the Palmrest Assembly.

3. Remove the keyboard and heatspreader.

4. Remove the hard drive.

5. Remove the screw from the middle of the battery charger board.

6. Unplug the battery charger board from the connector on the

Upper CPU Cover
DVD Drive
Battery Charger Board
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

system board, and lift it out of the chassis.

To replace the battery charger board, reverse the previous steps.

NOTE: When replacing the battery charger board, ensure the pins are aligned with the sockets on the system board connector before pressing the board in place.

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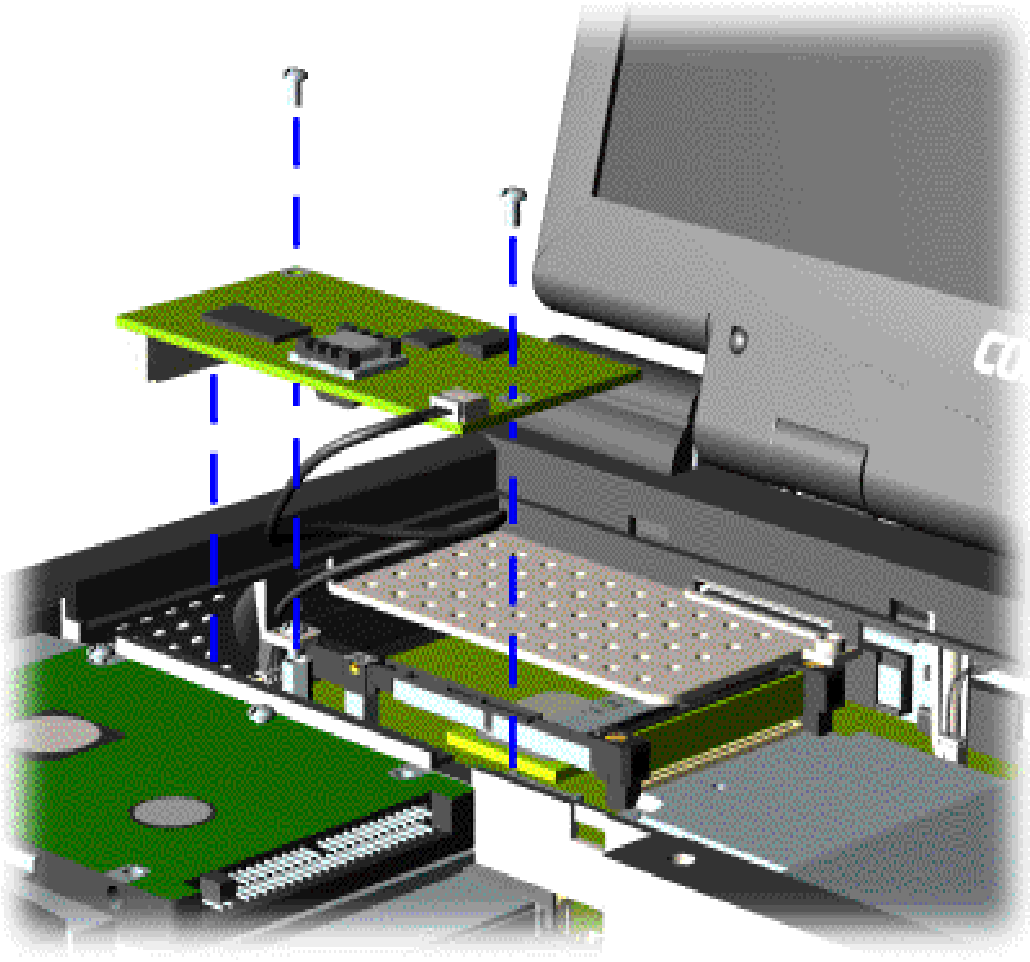

To remove the modem, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the Palmrest Assembly.

3. Remove the keyboard and heatspreader.

4. Remove the two screws securing the modem to the system board.

5. Pull the

Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

modem off the connector on the left-hand side of the system board.

Next Step

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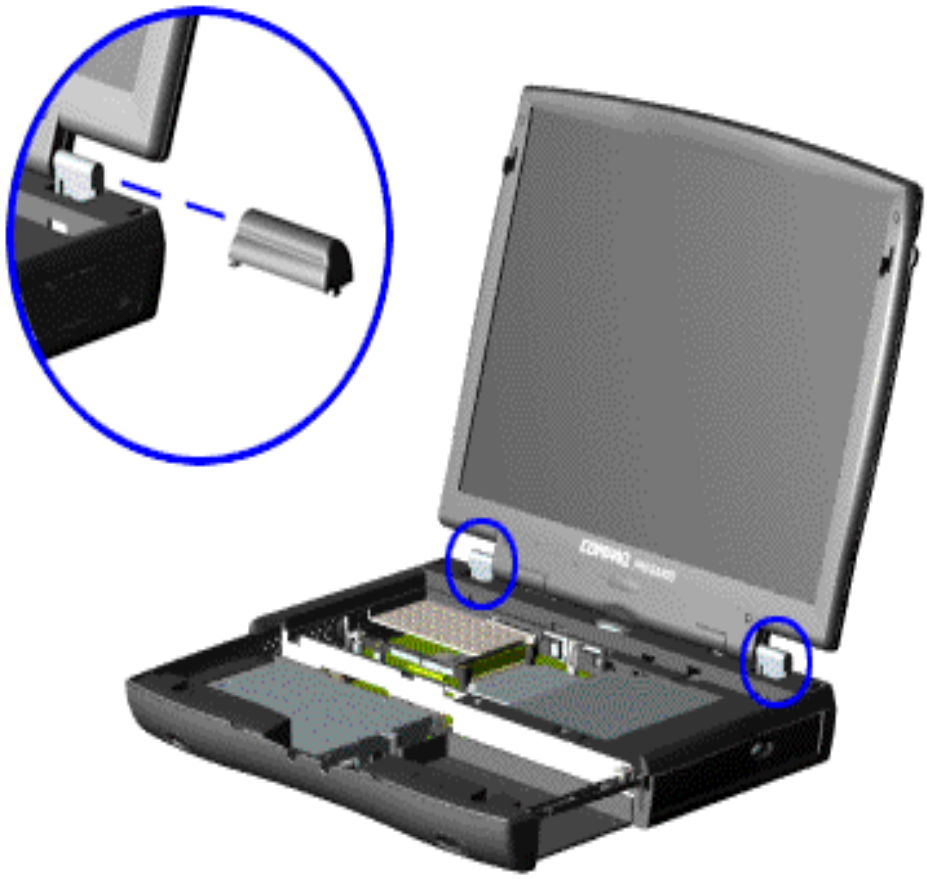

To remove the display panel assembly, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the Palmrest Assembly.

3. Remove the keyboard and heatspreader.

4. Remove the modem.

5. Pull up the hinge covers and

Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

carefully pry the covers off the chassis.

Next Step

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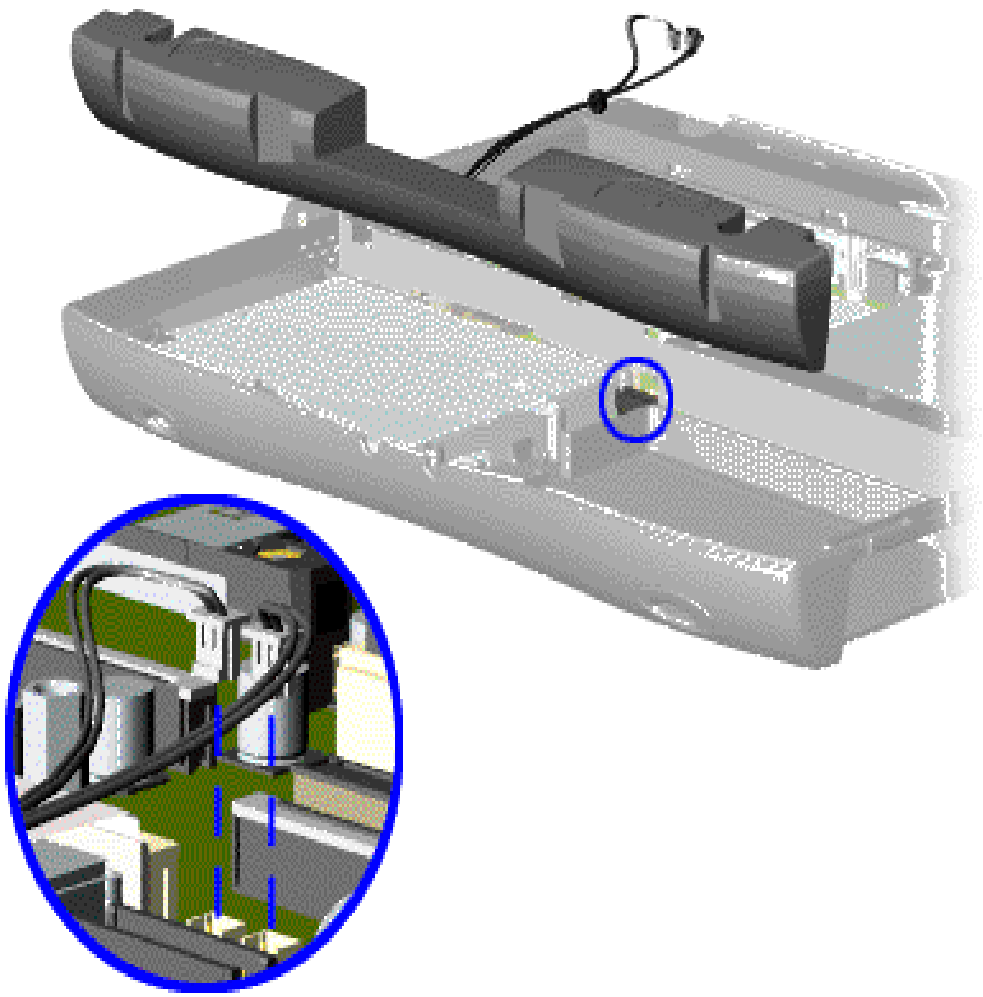

To remove the speaker assembly, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Remove the keyboard and heatspreader.

4. Remove the hard drive.

5. Remove

DVD Drive
Battery Charger Board
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
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the charger board.

6. Disconnect the speaker cables from the system board and remove the speaker assembly from the chassis.

To replace the speaker assembly, reverse the previous procedures.

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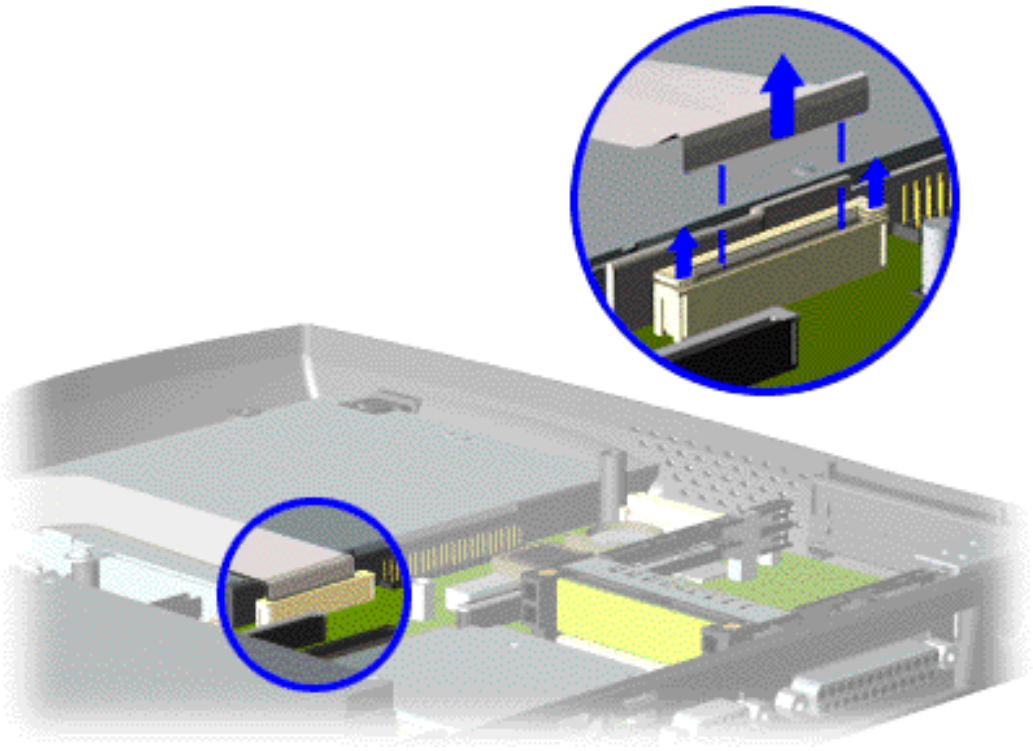
Hard Drives



To remove the diskette drive, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Remove the keyboard and heatspreader.

4. Remove the hard drive.

5. Remove the Upper CPU cover.

Upper CPU Cover
DVD Drive
Battery Charger Board
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

6. Remove the charger board.

7. Remove the speakers.

8. Disconnect the diskette drive data cable from the system board by pulling out the cable lock lip about 1 or 2 mm at each end, then removing the cable .

Next Step

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Removing the Fan Assembly

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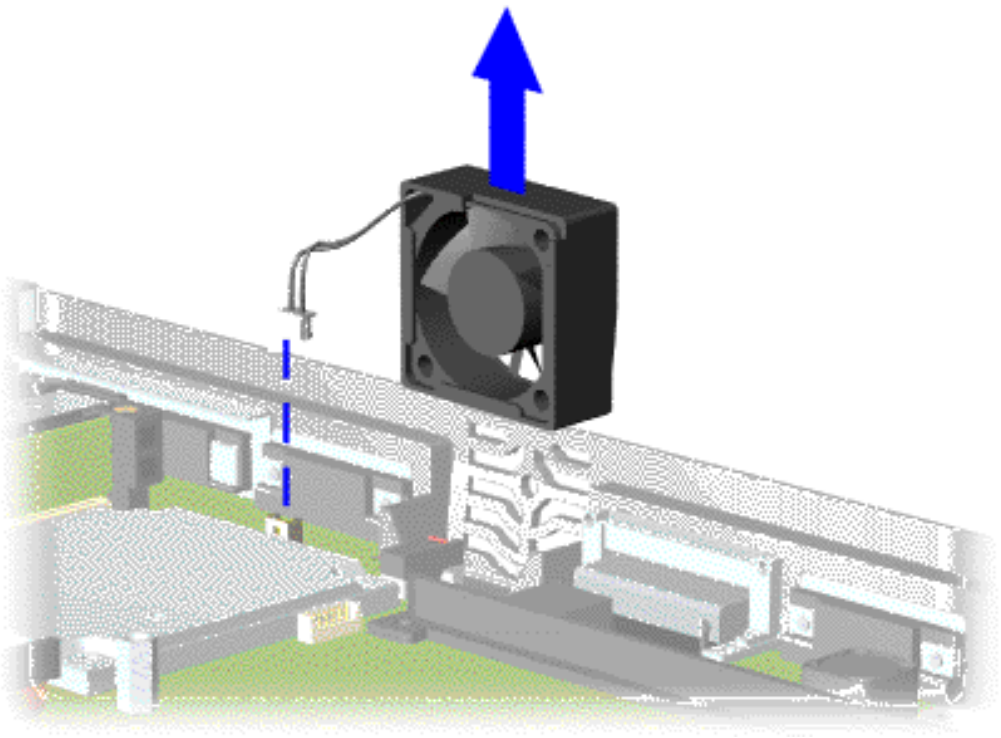
Service Considerations
Cables and Connectors
Preparing the Computer for Disassembly
Battery Pack
Palmrest Assembly
Keyboard and Heatspreader
Processor
Hard Drives



To remove the fan assembly, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Remove the keyboard and heatspreader.

4. Remove the display panel assembly.

5. Remove the hard drive.

6. Remove the Upper CPU cover.

7. Unplug the

Upper CPU Cover
DVD Drive
Battery Charger Board
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

fan cable and lift the fan assembly from the chassis slot.

To replace the fan assembly, reverse the previous steps.

NOTE Be sure to insert the fan as shown in the figure, to prevent damage to the cable.

Removing the Fan Gasket

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Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

To remove the system board, complete the following steps:

1. Prepare the computer for disassembly.
2. Remove the palmrest assembly.
3. Remove the keyboard and heatspreader.
4. Remove the hard drive.
5. Remove the Upper CPU Cover.
6. Remove the DVD drive.
7. Remove the battery charger board.
8. Remove the modem.
9. Remove the display panel assembly.
10. Disconnect the speaker assembly cables.
11. Remove the diskette drive.
12. Remove the fan.
13. Remove the processor.

Next Step

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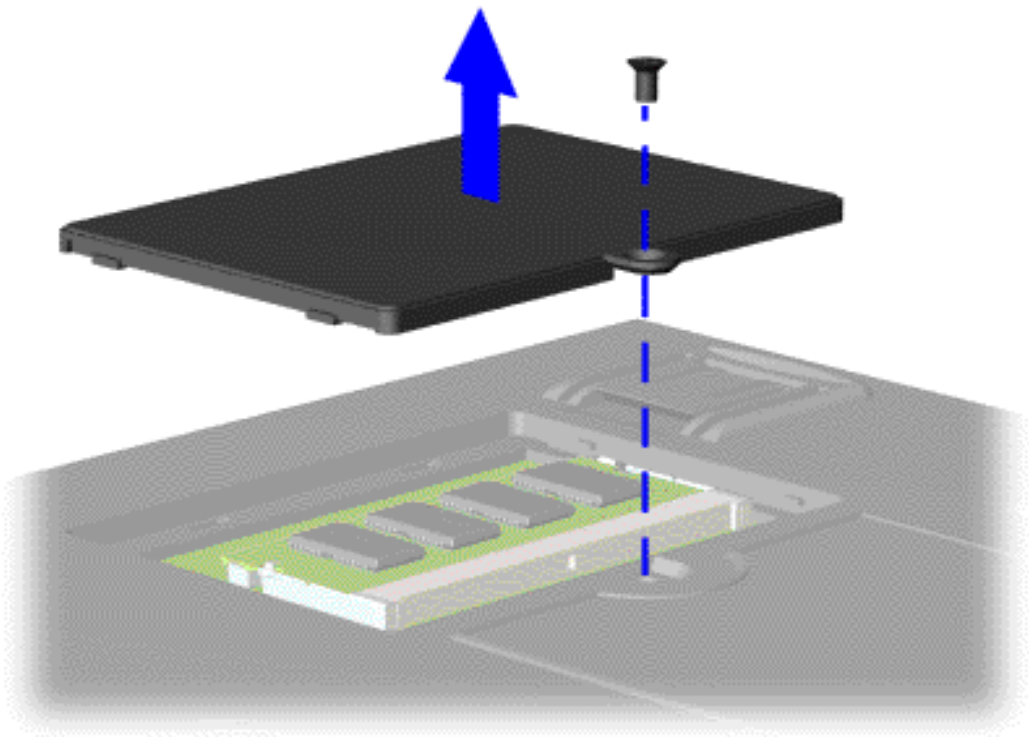

To remove the memory module, complete the following steps:

1. Prepare the computer for disassembly.

2. Close the computer and turn it upside down.

3. Remove the screw from the memory module door and pull the

Upper CPU Cover
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

door off.

Next Step

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System I/O Address
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DVD drive
Battery pack

System I/O Address

System I/O Address	
I/O Address (Hex)	**System Function (Shipping Configuration)**
0000h-000Fh	Direct memory access controller
0010h-001Fh	In use by unknown device
0020h-0021h	Programmable interrupt Controller
0022h-003Fh	In use by unknown device
0040h-0043h	System timer
0044h-005Fh	In use by unknown device
0060h-0060h	Standard 101/102-Key or Microsoft Natural Keyboard
0061h-0061h	System speaker
0062h-0063h	In use by unknown device
0064h-0064h	Standard 101/102-Key or Microsoft Natural Keyboard
0065h-006Fh	In use by unknown device
0070h-0071h	System CMOS/real time clock
0072h-0073h	Motherboard resources
0074h-007Fh	In use by unknown device
0080h-0080h	Motherboard resources
0081h-008Fh	Direct memory controller
0090h-009Fh	In use by unknown device
00A0h-00A1h	Programmable interrupt controller
00A2h-00BFh	In use by unknown device

00C0h-00DFh	Direct memory access Controller
00E0h-00EBh	In use by unknown device
00ECh-00EFh	Motherboard resources
00F0h-00FFh	Numeric data processor
0120h-0121h	NeoMagic MagicWave 3DX Sound System
0170h-0177h	Intel 82371AB/EB PCI Bus Master IDE controller
0170h-0177h	Secondary IDE controller (dual fifo)
01F0h-01F7h	Intel 82371AB/EB PCI Bus Master IDE controller
0170h-0177h	Primary IDE controller (dual fifo)
0200h-0200h	Gameport Joystick
0220h-02FFh	NeoMagic MagicWave 3DX Sound System
02F8h-02FFh	Compaq Presario 56K-DF
0330h-0331h	NeoMagic MagicWave 3DX Sound System
0376h-0376h	Intel 82371AB/EB PCI Bus Master IDE controller
0376h-0376h	Secondary IDE controller (dual fifo)
0378h-037Fh	Printer Port (LPT1)
0388h-038Fh	NeoMagic MagicWave 3DX Sound System
03B0h-03BBh	NeoMagic MagicMedia 256AV
03C0h-03DFh	NeoMagic MagicMedia 256AV
03F0h-03F5h	Standard Floppy Disk Controller
03F6h-03F6h	Intel 82371AB/EB PCI Bus Master IDE controller
03F6h-03F6h	Primary IDE controller (dual fifo)
03F7h-03F7h	Standard Floppy Disk Controller
03F8h-03FFh	Communications Port (COM1)
04D0h-04D1h	Motherboard resources
0530h-0537h	NeoMagic MagicWave 3DX Sound System
0CF8-0CFFh	PCI bus
2180h-218Fh	Motherboard resources
8000h-803Fh	Motherboard resources
FCD0h-FCD7h	Primary IDE controller (dual fifo)
FCD0h-FCDFh	Intel 82371AB/EB PCI Bus Master IDE Controller
FCD8h-FCDFh	Secondary IDE controller (dual fifo)
FCE0h-FCFFh	Intel 82371AB/EB PCI to USB Universal Host Controller

System Memory Catalog

System Memory Catalog	
Memory Address	**System Function**
00000000h-0009FFFFh	System board extension for PnP BIOS
000A0000h-000AFFFFh	NeoMagic MagicMedia 256AV
000B0000h-000BFFFFh	NeoMagic MagicMedia 256AV
000C0000h-000CBFFFh	NeoMagic MagicMedia 256AV
000E0000h-000E7FFFh	Motherboard resources

000E8000h-000FFFFFh	System board extension for PnP BIOS
00100000h-03FFFFFFh	System board extension for PnP BIOS
06000000h-06000FFFh	Texas Instruments PCI-1211 CardBus Controller
F6000000h-F6FFFFFFh	NeoMagic MagicMedia 256AV
F6000000h-F7BFFFFFh	Intel 82443BX Pentium II Processor to AGP Controller
F7800000h-F7BFFFFFh	NeoMagic MagicMedia 256AV Audio
F8000000h-F83FFFFFh	Intel 82443BX Pentium II Processor to PCI bridge
FE700000h-FE7FFFFFh	NeoMagic MagicMedia 256AV Audio
FE700000h-FECFFFFFh	Intel 82443BX Pentium II Processor to AGP Controller
FE800000h-FEBFFFFFh	NeoMagic MagicMedia 256AV
FEC00000h-FECFFFFFh	NeoMagic MagicMedia 256AV
FFF80000h-FFFFFFFFh	Motherboard resources

Display

13.3" TFT Display						
Model	**Sharp LQ133XILH05**		**Sanyo TM133XG-02L02**		**LG LP133X4-A**	
	U.S.	**Metric**	**U.S.**	**Metric**	**U.S.**	**Metric**
Dimensions Height Width	7.98 in 10.64 in	202.8mm 270.3mm	7.98 in 10.64 in	202.8mm 270.3mm	7.98 in 10.64 in	202.8mm 270.3mm
Display Dimensions Height Width Depth	8.43 in 11.18 in 0.28 in	214.0mm 284.0mm 7.0mm	8.43 in 11.46 in 0.27 in	214.0mm 291.0mm 6.8mm	8.46 in 11.18 in 0.27 in	215.0mm 284.0mm 6.9mm
Weight	19.0 oz	540 grams	18.3 oz	520 grams	18.3 oz	520 grams
Contrast Ratio	150:1		120:1		150:1	
Brightness	120 cd/mm³		100 cd/mm³		120 cd/mm³	
Total Power Consumption, W	3.5		not available		3.08	

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Diskette Drive

Diskette Drive			
Model	**Mitsumi D353F3**		
Capacity per Diskette (High/Low)			
Diskette Size	1.0MB	1.6MB	2.0MB
Number of LED Indicators (Read/Write)	None		
Drive Rotation (rpm)	300	360	300
Transfer Rate (Kbps)	250	500	500
KBytes per Sector [Sector]	0.256[16] 0.512[9] 1.024[5]	0.256[26] 0.512[15] 1.024[8]	0.256[32] 0.512[18] 1.024[10]
KBytes per Track [Sector]	4.096[16] 4.608[9] 5.120[5]	6.656[26] 7.680[15] 8.192[8]	8.192[32] 9.216[18] 10.24[10]
KBytes per Disk [Sector]	655.36[16] 737.28[9] 819.20[5]	1064.96[26] 1228.80[15] 1310.72[8]	1310.72[32] 1474.56[18] 1638.40[10]
Number of Read/Write Heads	2		

Hard Drive

Hard Drive						
Model	**Hitachi DK238A-43**	**IBM DKLA-24320**	**Fujitsu MHF2043AT**	**IBM DADA-26480**	**Hitachi DK228A-65**	**Fujitsu MHE2064AT**
Capacity Per Drive	4327MB	4320MB	4340MB	6480MB	6490MB	6490MB
Logical Configuration Cylinders Heads Sectors per track Bytes per sector	 8955 4 N/A 512	 8944 15 63 512	 8647 4 N/A 512	 13424 15 63 512	 8955 6 N/A 512	 8647 6 N/A 512
Typical Seek Times, ms (including settling) Single track Average Full stroke	 N/A 12ms N/A	 4ms 13ms 23ms	 2.5ms 13ms 23ms	 4ms 12ms 23ms	 N/A 12ms N/A	 2.5ms 13ms 23ms
Transfer Rate At interface	16.6MB/ sec (max)	16.6MB/ sec (max)	33.3MB/sec (U-DMA)	16.6MB/ sec (max)	16.6MB/ sec (max)	33.3MB/sec (U-DMA)

CD Drive

CD-ROM Drive						
Model	**XM-1802B**		**Mitsumi SR242S1**		**Sanyo CDR-U242-Z**	
Dimensions	128 x 12.7 x 129 mm	5.04 x 0.5 x 5.08 in	128 x 12.7 x 129 mm	5.04 x 0.5 x 5.08 in	128 x 12.7 x 129 mm	5.04 x 0.5 x 5.08 in
Weight	0.230kg	8.11 oz	0.27kg	9.52 oz	< 0.270kg	< 9.52 oz
Maximum Rotational Speed	24x		24x		24x	
Typical Sustained Data Transfer Rate	3600kB/sec (max)		3600kB/sec (max)		3600kB/sec	
Average Random Access Time	110ms		120ms		120ms	
Spin Up Time	2.7sec (max)		n/a		<10sec	
Data Buffer Capacity	128kB		128kB		256kB	

DVD Drive

DVD-ROM Drive						
Model	**Sanyo DRD-U220**		**Panasonic SR-8171**		**Toshiba SD-C2102**	
Dimensions	128 x 12.7 x 129 mm	5.04 x 0.5 x 5.08 in	128 x 12.7 x 127 mm	5.04 x 0.5 x 5.00 in	128 x 12.7 x 129 mm	5.04 x 0.5 x 5.08 in
Weight	< 0.280kg	< 9.87 oz	0.290kg	10.2 oz	0.280kg	9.87 oz
Rotational Speed	2.4x		2.0x (max)		2.4x	
Typical Sustained Data Transfer Rate	3240KB/sec (max)		2700KB/sec (max)		1352-3268KB/sec	

Typical Average Random Access Time	180ms	180ms	160ms
Spin Up Time	< 10sec	4sec	N/A
Data Buffer Capacity	256kB	512kB	128kB

Battery Pack

Lithium Ion (Li ion) Battery Pack	
Dimensions Height Length Width	 0.8 in (20.3 mm) 5.7 in (145 mm) 3.1 in (78.7 mm)
Weight	0.90 lb (408.2 g)
Energy Nominal Open Circuit Voltage Ah rating Capacity	 standard: 14.4 V enhanced: 14.8 V standard: 2600 mAh enhanced: 3000 mAh standard: 37.5 Wh enhanced: 44.5 Wh
Environmental Requirements Operating Temperature Non-operating Temperature Charging Temperature	 50°F to 95° F (10°C - 35°C) 32°F to 140°F (0°C - 60°C) 41°F to 113°F (5°C - 45°C)